



# STIC Search Report

**EIC 3700**

**STIC Database Tracking Number: 139341**

**TO: Charles Marmor**  
**Location: RND 7a29**  
**Art Unit: 3736**

**Case Serial Number: 10/069559**

**From: Jeanne Horrigan**  
**Location: RND 8A34**  
**Phone: 571-272-3529**

**jeanne.horrigan@uspto.gov**

## Search Notes

Attached are the search results for the EMG control of a limb prosthesis.

I tagged the items that seemed most relevant to me, however, I recommend that you review ALL of the results. I did NOT tag the articles by the inventor because ALL of them looked somewhat relevant to me and they all had good dates.

Also attached is a search feedback form. Completion of the form is voluntary. Your completing this form would help us improve our search services.

I hope the attached information is useful. Please feel free to contact me if you have any questions or need additional searching on this application.

**SEARCH REQUEST FORM****Scientific and Technical Information Center**

Requester's Full Name: Charles Marmor, II Examiner #: 74438 Date: 12/2/04  
 Art Unit: 3736 Phone Number 202-4730 Serial Number: 10/069,559  
 Mail Box and Bldg/Room Location: RAN 7A29 Results Format Preferred (circle): PAPER DISK E-MAIL

**If more than one search is submitted, please prioritize searches in order of need.**

\*\*\*\*\*

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: EMG Control of Prosthesis

Inventors (please provide full names): Ronald Raymond Riso

Earliest Priority Filing Date: 8/20/1999

*\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

*Methods of Controlling a prosthesis using a plurality of sets of dedicated electrodes or transducers that are implanted subcutaneously, epimesially or intramuscularly to detect electromyographic (EMG) or myoelectric signals from various muscles which are used to control a prosthetic device such as an arm or hand.*

\*\*\*\*\*

**STAFF USE ONLY**

	<b>Type of Search</b>	<b>Vendors and cost where applicable</b>
Searcher: <u>Jeanne Horgan</u>	NA Sequence (#) _____	STN _____
Searcher Phone #: <u>2-3529</u>	AA Sequence (#) _____	Dialog _____
Searcher Location: <u>RND8A34</u>	Structure (#) _____	Questel/Orbit _____
Date Searcher Picked Up: _____	Bibliographic _____	Dr.Link _____
Date Completed: _____	Litigation _____	Lexis/Nexis _____
Searcher Prep & Review Time: _____	Fulltext _____	Sequence Systems _____
Clerical Prep Time: _____	Patent Family _____	WWW/Internet _____
Online Time: _____	Other _____	Other (specify) _____

**Title: Technical aspects of the magnetic transcutaneous coupling of EMG signals**

Author(s): Becker, W.; Sorel, F.L.J.; Schlittenhardt, P.; Wehner, E.; Engelhardt, A.

Author Affiliation: European Atomic Energy Res. Center, Ispra, Italy

Journal: IEEE Transactions on Magnetics vol.Mag6, no.2 p.334-7

Publication Date: June 1970 Country of Publication: USA

CODEN: IEMGAQ ISSN: 0018-9464

Conference Title: Symposium on application of magnetism in bioengineering  
Conference Sponsor: Weizmann Inst. Sci.; IEEE, Magnetic and Biomedical engng. groups Israel Soc., Biomedical engng; silver Inst

Conference Date: 9-10 Dec. 1969 Conference Location: Rehovot, Israel

Language: English Document Type: Conference Paper (PA); Journal Paper (JP)

Abstract: For a long time application of **myoelectric** signal readout (e.g., for patients with controllable **limb** prothesis), a method which avoids the disadvantages of either skin surface **electrodes** or percutaneous galvanic conductors is described. The **electrodes** are placed directly at or inside the **muscle** which generates the wanted signals and are connected by means of two ductile wires to the coil fixed **subcutaneously**. Achieved advantages are good separation of signals originating from different **muscles**, improvement in the delivery of signals for a proportional control (to **muscle** activity) of, e.g. **artificial limbs**, and high probability of a good long time reliability because of the technical simplicity.

Subfile: A B

**Title: MICROELECTRONIC TELEMETRY IMPLANT FOR MYO-ELECTRIC CONTROL OF A POWERED PROSTHESIS .**

Author: Tucker, F. R.; Peteleski, N.

Corporate Source: Health Sci Cent, Winnipeg, Manit

Source: Canadian Electrical Engineering Journal v 2 n 4 Oct 1977 p 3-7

Publication Year: 1977

CODEN: CEEJDY ISSN: 0700-9216

Language: ENGLISH

Journal Announcement: 7807

Abstract: The routine **myoelectric** control systems use **electrodes** on the surface of the skin to pick up the electromyographic signals (**EMG**) from skeletal **muscles**. However, they are inconvenient to the user and susceptible to electrical interference. To avoid all the disadvantages of surface **electrodes** mentioned above, it is necessary to use an **implanted** transmitter which will broadcast the **EMG** for control of the external **prosthesis**. 27 refs.

**Title: Technical aspects of the magnetic transcutaneous coupling of EMG signals**

Author(s): Becker, W.; Sorel, F.L.J.; Schlittenhardt, P.; Wehner, E.; Engelhardt, A.

Author Affiliation: European Atomic Energy Res. Center, Ispra, Italy

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Conference Date: 9-10 Dec. 1969 Conference Location: Rehovot, Israel

Language: English Document Type: Conference Paper (PA); Journal Paper (JP)

Abstract: For a long time application of **myoelectric** signal readout (e.g., for patients with controllable **limb** prothesis), a method which avoids the disadvantages of either skin surface **electrodes** or percutaneous galvanic conductors is described. The **electrodes** are placed directly at or inside the **muscle** which generates the wanted signals and are connected by means of two ductile wires to the coil fixed **subcutaneously**. Achieved advantages are good separation of signals originating from different **muscles**, improvement in the delivery of signals for a proportional control (to **muscle** activity) of, e.g. **artificial limbs**, and high probability of a good long time reliability because of the technical simplicity.

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Author: Tucker, F. R.; Peteleski, N.

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File 155:MEDLINE(R) 1951-2004/Nov W4  
File 5:Biosis Previews(R) 1969-2004/Nov W3  
File 73:EMBASE 1974-2004/Nov W4  
File 34:SciSearch(R) Cited Ref Sci 1990-2004/Nov W4  
File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec  
File 144:Pascal 1973-2004/Nov W4

Set	Items	Description
S1	51	AU='RISO R' OR AU='RISO R.'
S2	52	AU='RISO R R' OR AU='RISO R RICHARD' OR AU='RISO R.R.' OR - AU='RISO RON':AU='RISO RR'
S3	25	RD (unique items)
S4	25	Sort S3/ALL/PY,A

4/7/5 (Item 5 from file: 434)  
DIALOG(R)File 434:SciSearch(R) Cited Ref Sci  
(c) 1998 Inst for Sci Info. All rts. reserv.  
04624347 Genuine Article#: PA018 Number of References: 0  
**Title: COMPARISON OF SUBDERMAL VERSUS SURFACE ELECTROCUTANEOUS STIMULATION**  
Author(s): RISO RR ; SZETO AYJ; KEITH MW  
Corporate Source: CASE WESTERN RESERVE UNIV,CTR REHABIL ENGN,DEPTBIOMED  
ENGN/CLEVELAND//OH/44106; CASE WESTERN RESERVE UNIV,DEPT  
ORTHOPAED/CLEVELAND//OH/44106; LOUISIANA TECH UNIV,DEPT BIOMED  
ENGN/RUSTON//LA/71272  
Journal: IEEE TRANSACTIONS ON BIOMEDICAL ENGINEERING, 1982, V29, N8, P606  
Language: ENGLISH Document Type: MEETING ABSTRACT

4/7/9 (Item 9 from file: 155)  
DIALOG(R)File 155:MEDLINE(R)  
(c) format only 2004 The Dialog Corp. All rts. reserv.  
08884759 PMID: 2026429  
**Cognitive feedback for use with FES upper extremity neuroprostheses.**  
Riso R R ; Ignagni A R; Keith M W  
Department of Biomedical Engineering, Case Western Reserve University,  
Cleveland, OH 44109.  
IEEE transactions on bio-medical engineering (UNITED STATES) { Jan 1991,  
38 (1) p29-38, ISSN 0018-9294 Journal Code: 0012737  
Contract/Grant No.: NO-1-NS-6-2302; NS; NINDS  
Document type: Journal Article  
Languages: ENGLISH  
Main Citation Owner: NLM  
Record type: Completed

This paper describes the development of two sensory substitutions systems that provide cognitive feedback for FES hand grasp restoration neuroprostheses. One system uses an array of five electrodes to provide machine status information and a spatially encoded representation of the command signal that a quadriplegic individual generates to achieve proportional grasp control. Only one electrode site is active at any given instant, and a second informational channel is superimposed on the spatial position channel by modulating the frequency of the stimulus pulses. The frequency modulated feedback channel signals six levels of force developed at the finger tips during prehension activities. The second sensory system is an integral part of an implanted FES system and utilizes a single subdermally placed electrode to display machine status information and a five-level frequency code for feedback of the user generated grasp control signal. The multielectrode feedback system was implemented for laboratory

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December 6, 2004

studies using surface mounted electrodes, although its design will ultimately incorporate subdermal electrodes to provide a highly cosmetic and unencumbering system. An evaluation of the effectiveness of grasp force and command signal feedback provided by this multielectrode system in assisting an FES hand system user to regulate grasp force during a laboratory task, showed increased consistency of performance and an economy of grasp effort between 25 and 30%. Alternative strategies for feedback information and coding algorithms are discussed.

Record Date Created: 19910610

Record Date Completed: 19910610

4/7/14 (Item 14 from file: 5)

DIALOG(R)File 5:BIOSIS Previews(R)

(c) 2004 BIOSIS. All rts. reserv.

0011137541 BIOSIS NO.: 199799771601

**Multichannel intraneural electrical stimulation for prosthetic sensory feedback**

AUTHOR: Dilorenzo Daniel J (Reprint); Edell David J (Reprint); Riso Ron R ; Koris Mark J; Larson Bruce C (Reprint); Devaney Lisa P (Reprint

AUTHOR ADDRESS: Harvard-MIT Div. Health Sci. Technol., Cambridge, MA 02139, USA\*\*USA

JOURNAL: Society for Neuroscience Abstracts 23 (1-2): p1004 1997 1997

CONFERENCE/MEETING: 27th Annual Meeting of the Society for Neuroscience, Part 1 New Orleans, Louisiana, USA October 25-30, 1997; 19971025

ISSN: 0190-5295

DOCUMENT TYPE: Meeting; Meeting Abstract; Meeting Poster

RECORD TYPE: Citation

LANGUAGE: English

4/7/17 (Item 17 from file: 155)

DIALOG(R)File 155:MEDLINE(R)

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10558879 PMID: 10665673

**Strategies for providing upper extremity amputees with tactile and hand position feedback--moving closer to the bionic arm.**

Riso R R

University of Aalborg, Center for Sensory-Motor Interaction, Denmark.  
rr@miba.auc.dk

Technology and health care - official journal of the European Society for Engineering and Medicine (NETHERLANDS), 1999, 7 (6) p401-9, ISSN 0928-7329 Journal Code: 9314590

Document type: Journal Article; Review; Review, Tutorial

Languages: ENGLISH

Main Citation Owner: NLM

Record type: Completed

A continuing challenge for prostheses developers is to replace the sensory function of the hand. This includes tactile sensitivity such as finger contact, grip force, object slippage, surface texture and temperature, as well as proprioceptive sense. One approach is sensory substitution whereby an intact sensory system such as vision, hearing or cutaneous sensation elsewhere on the body is used as an input channel for information related to the prosthesis. A second technique involves using electrical stimulation to deliver sensor derived information directly to the peripheral afferent nerves within the residual limb. Stimulation of the relevant afferent nerves can ultimately come closest to restoring the

original sensory perceptions of the hand, and to this end, researchers have already demonstrated some degree of functionality of the transected sensory nerves in studies with amputee subjects. This paper provides an overview of different types of nerve interface components and the advantages and disadvantages of employing each of them in sensory feedback systems. Issues of sensory perception, neurophysiology and anatomy relevant to hand sensation and function are discussed with respect to the selection of the different types of nerve interfaces. The goal of this paper is to outline what can be accomplished for implementing sensation into artificial arms in the near term by applying what is present or presently attainable technology. (26 Refs.)

Record Date Created: 20000302

Record Date Completed: 20000302

File 135:NewsRx Weekly Reports 1995-2004/Nov W4  
 File 481:DELPHEs Eur Bus 95-2004/Nov W3  
 File 624:McGraw-Hill Publications 1985-2004/Dec 06  
 File 635:Business Dateline(R) 1985-2004/Dec 04

Set	Items	Description
S1	427	ELECTROMYOGRA? OR MYOELECTRIC? OR EMG
S2	4581	ELECTRODES OR TRANSMITTERS
S3	28024	IMPLANT? OR SUBCUTANEOUS? OR SUBDERMAL? OR EPIM?SIUM OR EP- IM?SIA? OR INTRAMUSCULAR? OR INTRAFASCICUL? OR INTERFASCICUL?
S4	13670	ARTIFICIAL
S5	2225	PROSTHES?S OR PROSTHETIC?
S6	635124	ARM OR ARMS OR HAND OR HANDS OR LEG OR LEGS OR FOOT OR FEET OR LIMB OR LIMBS OR EXTREMITY OR EXTREMITIES
S7	25347	MUSCLE? OR MUSCULAR? OR FLEXOR OR EXTENSOR OR PRONATOR OR - SUPINATOR
S8	171	S2(S)S3
S9	508	S4(1W)S6 OR S5(3N)S6
S10	2	S8(S)S9 [too recent]
S11	1	S1(S)S8(S)S6(S)S7
S12	1	S11 NOT S10 [too recent]
S13	1	S1(S)S8(S)S6
S14	0	S13 NOT S12

File 155:MEDLINE(R) 1951-2004/Nov W4  
 File 5:Biosis Previews(R) 1969-2004/Nov W3  
 File 73:EMBASE 1974-2004/Nov W4  
 File 34:SciSearch(R) Cited Ref Sci 1990-2004/Nov W4  
 File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec  
 File 144:Pascal 1973-2004/Nov W4  
 File 2:INSPEC 1969-2004/Nov W4  
 File 6:NTIS 1964-2004/Nov W4  
 File 8:Ei Compendex(R) 1970-2004/Nov W4  
 File 35:Dissertation Abs Online 1861-2004/Nov  
 File 65:Inside Conferences 1993-2004/Dec W1  
 File 94:JICST-EPlus 1985-2004/Oct W5  
 File 95:TEME-Technology & Management 1989-2004/Jun W1  
 File 99:Wilson Appl. Sci & Tech Abs 1983-2004/Oct

Set	Items	Description
S1	203595	ELECTROMYOGRA? OR MYOELECTRIC? OR EMG
S2	411193	PROSTHES?S OR PROSTHETIC? OR ARTIFICIAL() (ARM OR ARMS OR H- AND OR HANDS OR LEG OR LEGS OR FOOT OR FEET OR LIMB? ?)
S3	1470864	IMPLANT? OR SUBCUTANEOUS? OR SUBDERMAL? OR EPIM?SIUM OR EP- IM?SIA? OR INTRAMUSCULAR? OR INTRAFASCICUL? OR INTERFASCICUL?
S4	568504	ELECTRODES OR TRANSMITTERS
S5	2814641	MUSCLE? OR MUSCULAR? OR FLEXOR OR EXTENSOR OR PRONATOR OR - SUPINATOR
S6	0	S S3(S)S4
S7	39811	S3(S)S4
S8	68	S1 AND S2 AND S7 AND S5
S9	40	RD (unique items)
S10	15	S9/2000:2004
S11	25	S9 NOT S10
S12	25	Sort S11/ALL/PY,A
S13	2411042	ARM OR ARMS OR HAND OR HANDS OR LEG OR LEGS OR FOOT OR FEET OR LIMB OR EXTREMITY OR EXTREMITIES



S14 408844 PROSTHES?S OR PROSTHETIC?  
S15 1063290 ARTIFICIAL  
S16 14415 S15(1W)S13 OR S14(2N)S13  
S17 1412 S1 AND S16  
S18 16 S7 AND S17  
S19 4 S18 NOT S8

12/6/3 (Item 3 from file: 73)

00343156 EMBASE No: 1975115518

Theory and design of capacitor electrodes for chronic stimulation  
1974

12/6/8 (Item 8 from file: 8)

02102471

Title: ELECTROMYOGRAPHY AND ACCELERATION OF THE TRUNK AS TRIGGER  
SOURCES FOR IMPLANTABLE GAIT STIMULATION.

Conference Title: Proceedings of the Eighth Annual Conference on  
Rehabilitation Technology: Technology - A Bridge to Independence.

Publication Year: 1985

12/6/10 (Item 10 from file: 8)

02102421

Title: INPUT-OUTPUT RESPONSE OF THE QUADRICEPS MUSCLE IN PARAPLEGIC  
PATIENTS.

Conference Title: Proceedings of the Eighth Annual Conference on  
Rehabilitation Technology: Technology - A Bridge to Independence.

Publication Year: 1985

12/6/11 (Item 11 from file: 2)

02825072 INSPEC Abstract Number: A87028778, B87014941

Title: Prediction and evaluation of ankle movement with implantable  
peroneal stimulators

Publication Date: 1986

12/6/14 (Item 14 from file: 155)

08607078 PMID: 2377004

Study of the effects of motor unit recruitment and firing statistics on  
the signal-to-noise ratio of a myoelectric control channel.

May 1990

12/6/15 (Item 15 from file: 155)

08523226 PMID: 2336907

[Electromyographic findings in the gluteal muscles in the Watson-Jones  
and the Bauer surgical approaches to the hip joint]

Elektromyograficky nalez v glutealnim svalstvu pri Watsonove-Jonesove a  
Bauerove pristupu ke kycelnimu kloubu.

Feb 1990

12/6/18 (Item 18 from file: 2)

5514245 INSPEC Abstract Number: A9707-8730-011, B9704-7520E-007

Title: The relationship between stimulus parameters and muscle response  
utilising implantable stimulator

Publication Date: 1996

Copyright 1997, IEE

12/6/19 (Item 19 from file: 95)  
01011159 I96070983941  
**Quantification of recruitment properties of multiple contact cuff electrodes**  
(Quantifizierung der Messeigenschaften von Mehrfach-Cuff-Elektroden)  
1996

12/7/1 (Item 1 from file: 2)  
DIALOG(R) File 2:INSPEC  
(c) 2004 Institution of Electrical Engineers. All rts. reserv.  
00200239 INSPEC Abstract Number: B70039092  
**Title: Technical aspects of the magnetic transcutaneous coupling of EMG signals**  
Author(s): Becker, W.; Sorel, F.L.J.; Schlittenhardt, P.; Wehner, E.; Engelhardt, A.  
Author Affiliation: European Atomic Energy Res. Center, Ispra, Italy  
Journal: IEEE Transactions on Magnetics vol.Mag6, no.2 p.334-7  
Publication Date: June 1970 Country of Publication: USA  
CODEN: IEMGAQ ISSN: 0018-9464  
Conference Title: Symposium on application of magnetism in bioengineering  
Conference Sponsor: Weizmann Inst. Sci.; IEEE, Magnetic and Biomedical engng. groups Israel Soc., Biomedical engng; silver Inst  
Conference Date: 9-10 Dec. 1969 Conference Location: Rehovot, Israel  
Language: English Document Type: Conference Paper (PA); Journal Paper (JP)  
Abstract: For a long time application of **myoelectric** signal readout (e.g., for patients with controllable **limb** prothesis), a method which avoids the disadvantages of either skin surface **electrodes** or percutaneous galvanic conductors is described. The **electrodes** are placed directly at or inside the **muscle** which generates the wanted signals and are connected by means of two ductile wires to the coil fixed **subcutaneously**. Achieved advantages are good separation of signals originating from different **muscles**, improvement in the delivery of signals for a proportional control (to **muscle** activity) of, e.g. **artificial limbs**, and high probability of a good long time reliability because of the technical simplicity.  
Subfile: A B

12/7/2 (Item 2 from file: 155)  
DIALOG(R) File 155:MEDLINE(R)  
(c) format only 2004 The Dialog Corp. All rts. reserv.  
03758885 PMID: 4786757  
**[Technical facilities for arm and hand function]**  
Tekniska hjalpmedel for **arm-** och **handfunktion**.  
Lakartidningen (SWEDEN) Aug 1 1973, 70 (31) p2731-9, ISSN 0023-7205  
Journal Code: 0027707  
Document type: Journal Article  
Languages: SWEDISH  
Main Citation Owner: NLM  
Record type: Completed  
Record Date Created: 19740605  
Record Date Completed: 19740605

12/7/5 (Item 5 from file: 8)  
DIALOG(R) File 8:Ei Compendex(R)  
(c) 2004 Elsevier Eng. Info. Inc. All rts. reserv.  
00728411 E.I. Monthly No: EI7807052773 E.I. Yearly No: EI78069095

**Title: MICROELECTRONIC TELEMETRY IMPLANT FOR MYO-ELECTRIC CONTROL OF A POWERED PROSTHESIS .**

Author: Tucker, F. R.; Peteleski, N.

Corporate Source: Health Sci Cent, Winnipeg, Manit

Source: Canadian Electrical Engineering Journal v 2 n 4 Oct 1977 p 3-7

Publication Year: 1977

CODEN: CEEJDY ISSN: 0700-9216

Language: ENGLISH

Journal Announcement: 7807

Abstract: The routine **myoelectric** control systems use **electrodes** on the surface of the skin to pick up the electromyographic signals (**EMG**) from skeletal **muscles**. However, they are inconvenient to the user and susceptible to electrical interference. To avoid all the disadvantages of surface **electrodes** mentioned above, it is necessary to use an **implanted** transmitter which will broadcast the **EMG** for control of the external **prosthesis**. 27 refs.

12/7/6 (Item 6 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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05694892 PMID: 7027837

**Implantable electrical and mechanical interfaces with nerve and muscle.**

Hoffer J A; Loeb G E

Annals of biomedical engineering (UNITED STATES) 1980 8 (4-6)  
p351-60, ISSN 0090-6964 Journal Code: 0361512

Document type: Journal Article; Review

Languages: ENGLISH

Main Citation Owner: NLM

Record type: Completed

(26 Refs.)

Record Date Created: 19811221

Record Date Completed: 19811221

12/7/7 (Item 7 from file: 2)

DIALOG(R) File 2:INSPEC

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02326891 INSPEC Abstract Number: A84093969, B84056188

**Title: Bioelectric control of powered prosthesis for amputees**

Author(s): Charles, D.; Stein, R.B.

Author Affiliation: Dept. of Physiology, Univ. of Alberta, Edmonton, Alta., Canada

Conference Title: Frontiers of Engineering and Computing in Health Care - 1983. Proceedings of the Fifth Annual Conference p.678

Editor(s): Gerhard, G.C.; Miller, W.T.

Publisher: IEEE, New York, NY, USA

Publication Date: 1983 Country of Publication: USA 735 pp.

Conference Sponsor: IEEE

Conference Date: 10-12 Sept. 1983 Conference Location: Columbus, OH, USA

Language: English Document Type: Conference Paper (PA)

Treatment: Practical (P); Experimental (X)

Abstract: Summary form only given. Forty upper **extremity** human amputees have been fitted with powered electric **prostheses**. Different methods of controlling these **prostheses** are compared and evaluated. The most common method processes **EMG** signals obtained from skin surface **electrodes** over the remaining **muscles**. Processing may include different degrees of

filtering, one or more levels of threshold switching, or various types of proportional control. For amputees at shoulder level for whom satisfactory **muscle** control sites are not available, different methods must be used. Skin conductivity touch control may be used to replace bulky and unreliable mechanical switches. Recent developments in chronic nerve recording using **permanently implantable nerve cuffs** are discussed, together with the development of an FM-telemetry system which may avoid the risks otherwise associated with passing signal leads through the skin on a long-term basis.

Subfile: A B

12/7/9 (Item 9 from file: 8)

DIALOG(R) File 8: Ei Compendex(R)

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02102422 E.I. Monthly No: EIM8607-044743

**Title: EXPERIENCE WITH A HELICAL PERCUTANEOUS ELECTRODE IN THE HUMAN LOWER EXTREMITY.**

Author: Marsolais, E. B.; Kobetic, Rudi

Corporate Source: Cleveland Veterans Administration Medical Cent, Cleveland, OH, USA

Conference Title: Proceedings of the Eighth Annual Conference on Rehabilitation Technology: Technology - A Bridge to Independence.

Conference Location: Memphis, TN, USA Conference Date: 19850624

Sponsor: Rehabilitation Engineering Soc of North America, Washington, DC, USA

E.I. Conference No.: 07847

Source: Publ by Rehabilitation Engineering Soc of North America, Washington, DC, USA p 243-245

Publication Year: 1985

Language: English

Document Type: PA; (Conference Paper)

Journal Announcement: 8607

Abstract: Helical percutaneous **electrodes** have been **implanted** in major **muscles** of the hip and leg of complete paraplegics. Preprogrammed stimulation patterns, delivered by a 32-channel microprocessor controlled stimulator, have allowed standing and functional walking. Analysis of the histories of 702 **electrodes implanted** in six subjects over a period of 29 months showed a probability of failure which decreased exponentially during the first four months, and then continued constant at 2-3%/month thereafter. (Author abstract) 7 refs.

12/7/13 (Item 13 from file: 8)

DIALOG(R) File 8: Ei Compendex(R)

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02520735 E.I. Monthly No: EIM8801-000630

**Title: FUNCTIONAL ACTIVATION OF SKELETAL MUSCLES USING EPIMYSIAL SIMULATION ELECTRODES.**

Author: Fang, Zi-Ping; Mortimer, J. Thomas

Corporate Source: Case Western Reserve Univ, Cleveland, OH, USA

Conference Title: Proceedings of the Thirteenth Annual Northeast Bioengineering Conference.

Conference Location: Philadelphia, PA, USA Conference Date: 19870312

Sponsor: Drexel Univ, Philadelphia, PA, USA; IEEE, Engineering in Medicine & Biology Soc, New York, NY, USA; Univ of Pennsylvania, Philadelphia, PA, USA

E.I. Conference No.: 10506

Source: Bioengineering, Proceedings of the Northeast Conference 13th.  
Publ by IEEE, New York, NY, USA. Available from IEEE Service Cent (Cat n  
87CH2436-4), Piscataway, NJ, USA p 570-573

Publication Year: 1987

CODEN: BENYDB

Language: English

Document Type: PA; (Conference Paper)

Journal Announcement: 8801

Abstract: An **epimysial** electrode (an electrode **implanted** on the surface of the **muscle** ) has been designed for stimulation applications and tested in chronic animal experiments. The electrode consists of a platinum conducting surface, a silicone rubber insulation package and a helical lead. Fifteen **electrodes** were **implanted** on the hind **leg muscles** of five cats. Electrical stimulation was applied 24 hours per day for up to one year. Monthly noninvasive ankle torque measurements showed stable force modulation properties throughout the **implantation-stimulation** period. All the **electrodes** were intact and no tissue damage was observed on inspection at the end of the long-term experiments. The results indicate that the **epimysial** electrode can be reliably used in functional **neuromuscular** stimulation systems to restore lost motor functions in paralyzed patients.  
8 refs.

12/7/21 (Item 21 from file: 2)

DIALOG(R)File 2:INSPEC

(c) 2004 Institution of Electrical Engineers. All rts. reserv.

6396218 INSPEC Abstract Number: C1999-12-3385C-010

Title: **Adaptation of arm movement control under repeated perturbations**

Author(s): Weber, D.J.; Chi, A.; Ji-Ping He

Author Affiliation: Arizona State Univ., Tempe, AZ, USA

Conference Title: Proceedings of the 20th Annual International Conference of the IEEE Engineering in Medicine and Biology Society. Vol.20 Biomedical Engineering Towards the Year 2000 and Beyond (Cat. No.98CH36286) Part vol.5 p.2354-7 vol.5

Editor(s): Chang, H.K.; Zhang, Y.T.

Publisher: IEEE, Piscataway, NJ, USA

Publication Date: 1998 Country of Publication: USA 6 vol.  
xviii+xix+3384 pp.

ISBN: 0 7803 5164 9 Material Identity Number: XX-1999-00307

U.S. Copyright Clearance Center Code: 0 7803 5164 9/98/\$10.00

Conference Title: Proceedings of the 20th Annual International Conference of the IEEE Engineering in Medicine and Biology Society. Vol.20 Biomedical Engineering Towards the Year 2000 and Beyond

Conference Sponsor: Biomed. Div. Hong Kong Inst. Eng.; Chinese Biomed. Eng. Soc

Conference Date: 29 Oct.-1 Nov. 1998 Conference Location: Hong Kong, China

Language: English Document Type: Conference Paper (PA)

Treatment: Experimental (X)

Abstract: To develop control strategies for a **prosthetic arm** or electrical stimulation of paralyzed **muscles**, we have designed a novel approach to investigate how the neural system utilizes available sensory information to learn and adapt to a perturbation for the intended **arm** reaching movement. A parallel approach of both human and animal experiments allows us to collect data from cortical neurons, **muscles** and **arm** movement kinematics to analyze coordinated changes in control strategy of various

Serial 10/069559

December 6, 2004

levels in the sensorimotor system. We simultaneously record neural activities in motor cortex, **EMG** responses in 7 **arm muscles**, and **arm** movement trajectories during a visually guided reaching task. Force perturbations (an impulse of 75-100 ms) are delivered through a string attached to the wrist of the moving **arm**. Preliminary results and data analysis demonstrate that human subjects develop an anticipatory strategy to improve performance of reaching tasks under repeated force perturbations applied to the wrist. The same experimental protocol has been modified to rhesus monkeys with **implanted** multichannel cortical **electrodes**. Data collected from this experiment show that correlation of adaptation among individual and populations of cortical neurons, **muscle** coordination patterns, and kinematics can be established. (10 Refs) Subfile: C

Copyright 1999, IEE

12/7/23 (Item 23 from file: 2)

DIALOG(R)File 2:INSPEC

(c) 2004 Institution of Electrical Engineers. All rts. reserv.

6483346 INSPEC Abstract Number: A2000-05-8770J-018, B2000-03-7520E-007, C2000-03-3385C-004

**Title: Upper limb prosthesis controlled by myoelectric signal**

Author(s): Escudero, Z.; Leija, L.; Alvarez, J.; Munoz, R.

Author Affiliation: Centro de Investigacion y de Estudios Avanzados, IPN, Mexico City, Mexico

Conference Title: Proceedings of the First Joint BMES/EMBS Conference. 1999 IEEE Engineering in Medicine and Biology 21st Annual Conference and the 1999 Annual Fall Meeting of the Biomedical Engineering Society (Cat. No.99CH37015) Part vol.1 p.636 vol.1

Publisher: IEEE, Piscataway, NJ, USA

Publication Date: 1999 Country of Publication: USA 2 vol. vi+1345 pp.

ISBN: 0 7803 5674 8 Material Identity Number: XX-1999-03127

U.S. Copyright Clearance Center Code: 0 7803 5674 8/99/\$10.00

Conference Title: Proceedings of the First Joint BMES/EMBS Conference

Conference Sponsor: Medtronic; Johnson &amp; Johnson; Baxter Cardio Vascular Group; Becton Dickinson &amp; Co.; Georgia Biomed. Partnership; Guidant Found.; Kilpatrick Stockton LLP; King &amp; Spaulding; Troutman Sanders LLP; Adv. Tissue Sci.; AVL Biosense Corp.; CUH2A; Ernst &amp; Young LLP; State of Georgia; Dept. Ind.; Trade &amp; Tourism; Healthdyne Companies; Long Aldrige &amp; Norman; Porex Corp.; Sulzer Innotec; Turner Constr. Company

Conference Date: 13-16 Oct. 1999 Conference Location: Atlanta, GA, USA

Language: English Document Type: Conference Paper (PA)

Treatment: Practical (P)

Abstract: The authors propose a design of a **myoelectric prosthesis** with two active and one passive degrees of freedom to fit on a **limb** with an above elbow amputation. It will be controlled by **myoelectric electrodes implanted** directly on the **muscle** surface. (3 Refs)

Subfile: A B C

Copyright 2000, IEE

12/7/25 (Item 25 from file: 35)

DIALOG(R)File 35:Dissertation Abs Online

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01796238 ORDER NO: AADAA-I9932516

**PRIMARY MOTOR CORTEX: FUNCTIONAL REORGANIZATION WITH ACQUISITION OF SUBTLY CHANGING MOTOR TASKS, AND SUITABILITY OF MULTI-SITE, MULTI-UNIT CORTICAL RECORDINGS FOR CONTROL OF A PROSTHETIC DEVICE (MAPS, INTRACORTICAL**

**MICROSTIMULATION)**

Author: HOCHBERG, LEIGH ROBERT

Degree: PH.D.

Year: 1999

Corporate Source/Institution: EMORY UNIVERSITY (0665)

Adviser: DONALD R. HUMPHREY

Source: VOLUME 60/06-B OF DISSERTATION ABSTRACTS INTERNATIONAL.

PAGE 2541. 232 PAGES

Previous investigations have suggested that MI forelimb maps, defined by intracortical microstimulation (ICMS), change when a monkey learns new motor skills. However, some of the observed map changes in these studies may have been "set" related, and not demonstrative of more enduring changes in synaptic efficacy. In the first study reported here, we attempted to circumvent this problem by using chronically implanted microelectrodes to determine whether MI maps change during the acquisition of subtle shifts in forelimb tasks, and whether map changes persist in the alert animal outside of the training paradigm.

A monkey was first trained to perform a visually-guided step tracking task. EMG leads were implanted into four forearm muscles, and 36 microwire electrodes were implanted into the contralateral NE arm-hand area. Using ICMS, initial muscle maps were obtained. These and all subsequent maps were obtained on *non-training days*, while the monkey simply held the manipulandum in a fixed position. The animal was then required to track a pseudo-randomly, continuously moving target, but using the same wrist movements as used previously. After learning this task, new MI maps were collected. The relationship between the direction of wrist and cursor movement was then reversed, and maps were collected during acquisition of this second new task. With acquisition of both new motor tasks, MI maps fractionated and/or changed shape, with a disappearance of evoked responses at the site of initially *lowest* threshold. Spatial correlations between muscle maps also changed with task acquisition. These data support the conclusion that motor learning is indeed accompanied, day-to-day, by the persistent functional reorganization of MI.

NU could also provide signals for control of a prosthesis by paralyzed persons if stable, discriminable signals could be obtained. Using the same chronically implanted microwire technology, we collected multi-unit MI recordings from a monkey performing wrist and reaching movements. From quantitative (though not spatially localized) differences in activity across the MI arm/hand area, neural commands for these different movements could be distinguished reliably. We conclude that summed spikes from neuronal clusters may be useful for the direct, real-time control of a prosthetic device.

19/7/1 (Item 1 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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04310619 PMID: 985948

[Development of powered prosthetic hands]

Kato I; Tanaka S

Iyo denshi to seitai kogaku. Japanese journal of medical electronics and biological engineering (JAPAN) Feb 1976, 14 (1) p1-8, ISSN 0021-3292  
Journal Code: 17720370R

Document type: Journal Article

Languages: JAPANESE

ASRC Searcher: Jeanne Horrigan  
Serial 10/069559  
December 6, 2004

13

Main Citation Owner: NLM  
Record type: Completed  
Record Date Created: 19761002  
Record Date Completed: 19761002



Serial 10/069559

December 6, 2004

File 149:TGG Health&Wellness DB(SM) 1976-2004/Nov W1  
 File 441:ESPICOM Pharm&Med DEVICE NEWS 2004/Dec W1  
 File 16:Gale Group PROMT(R) 1990-2004/Dec 06  
 File 160:Gale Group PROMT(R) 1972-1989  
 File 148:Gale Group Trade & Industry DB 1976-2004/Dec 06  
 File 9:Business & Industry(R) Jul/1994-2004/Dec 03  
 File 98:General Sci Abs/Full-Text 1984-2004/Sep  
 File 636:Gale Group Newsletter DB(TM) 1987-2004/Dec 06  
 File 369:New Scientist 1994-2004/Nov W3  
 File 370:Science 1996-1999/Jul W3  
 File 20:Dialog Global Reporter 1997-2004/Dec 06

Set	Items	Description
S1	9197	ELECTROMYOGRA? OR MYOELECTRIC? OR EMG
S2	35479	PROSTHES?S OR PROSTHETIC? OR ARTIFICIAL() (ARM OR ARMS OR H- AND OR HANDS OR LEG OR LEGS OR FOOT OR FEET OR LIMB? ?)
S3	170769	IMPLANT? OR SUBCUTANEOUS? OR SUBDERMAL? OR EPIM?SIUM OR EP- IM?SIA? OR INTRAMUSCULAR? OR INTRAFASCICUL? OR INTERFASCICUL?
S4	88399	ELECTRODES OR TRANSMITTERS
S5	359295	MUSCLE? OR MUSCULAR? OR FLEXOR OR EXTENSOR OR PRONATOR OR - SUPINATOR
S6	31682	PROSTHES?S OR PROSTHETIC?
S7	291307	ARTIFICIAL
S8	6925616	ARM OR ARMS OR HAND OR HANDS OR LEG OR LEGS OR FOOT OR FEET OR LIMB OR LIMBS OR EXTREMITY OR EXTREMITIES
S9	7965	S6(3N)S8 OR S7(1W)S8
S10	81	S1(S)S9
S11	541	S4(5N)S5
S12	1533	S4(5N)S3
S13	1	S10(S)S12
S14	7	S1 AND S9 AND S12
S15	6	S14 NOT S13
S16	4	RD (unique items)
S17	27	S9(S)S12
S18	25	S17 NOT S13:S14
S19	20	RD (unique items)
S20	16	S19/2000:2004
S21	4	S19 NOT S20

13/7,K/1 (Item 1 from file: 160)

DIALOG(R)File 160:Gale Group PROMT(R)

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00370189

The Boston Arm, an electric artificial limb, will reach commercial markets in 6-8 mo, according to Liberty Mutual Research Center spokesmen.

Tech Times March, 1977 p. 1,21

It will represent the first mass-produced commercial prosthesis. The myoelectric (muscle electric) operates by amplifying electronic signals from remnant muscles in the amputee's upper arm or shoulder and sending the signals through a control circuit to move the arm. The amputee controls the electronic impulses by natural muscle contraction. Weighing 2.5 lbs, the arm is a lightweight, compact power transfer system. In contrast, conventional prosthetic arms operate with cables or wires attached to the wearer's body. The amputee must learn to pull and twist his body in unnatural ways to move the arm, says Dr R Mann, professor of Biomedical Engineering at MIT. Mann applied his knowledge of small air-to-air missile

power systems in redesigning the **arm** four times in 14 years. Liberty Mutual funded much of the **arm's** research since 1962 and will distribute it after completing tests of the nickel cadmium batteries. Another method for strengthening electrical signals, currently under study by Dr C Deluca at Liberty Mutual, consists of **implanting electrodes** directly into the nerves rather than around **muscle** points. Still another idea for faster response would be to regulate each **arm's** deadband, a fixed signal below which the **arm** won't move, according to individual **muscle** activity. The advantage would be more delicate control at lower **muscle** activity.

16/3,AB,K/1 (Item 1 from file: 149)  
DIALOG(R) File 149:TGG Health&Wellness DB(SM)  
(c) 2004 The Gale Group. All rts. reserv.  
01057173 SUPPLIER NUMBER: 02600085 (USE FORMAT 7 OR 9 FOR FULL TEXT)  
Using prosthetics to aid independence. (roundtable discussion) (Outlook  
1983-physiatry - part 3)

Demarest, Colleen B.  
Patient Care, v17, p45(13)  
Jan 15, 1983

PUBLICATION FORMAT: Magazine/Journal ISSN: 0031-305X LANGUAGE: English  
RECORD TYPE: Fulltext TARGET AUDIENCE: Professional  
WORD COUNT: 2903 LINE COUNT: 00283

Lehneis From that research, we were able to develop an upper **extremity prostheses** --the **myoelectric prosthesis** --that contains **electrodes** located where the patient can contract his intact **muscles** to operate the...  
...amputee only has so many **muscles** that he can use. If it were possible to **implant electrodes**, discrete **muscle** control, such as finger movement, might be effected. But this is difficult to achieve with surface **electrodes**.

Goodgold Would you comment on how the **myoelectric hand**, as opposed to a conventional device like a hook, might affect the patient's...  
...If the patient is a plumber or electrician, for example, a device such as the **myoelectric arm** or **hand** will not help him when he returns to work; the device contains...  
...needed. A patient who has a desk job might prefer the cosmetic advantage of the **myoelectric prosthesis**, since the **hand** portion does look like a **hand**. Also, any amputee today who does not want to...work with biofeedback [see "Putting biofeedback into perspective," page 37].

PC There are reports of **implantable electrodes** being used to produce motion in patients incapable of movement.

Grynbaum Some work has been...  
...First, unless the patient has sensory feedback, he will not know the location of the **prosthetic limb**, so the sophisticated movements will be of no help. And second, a patient will only...  
...agree?

Lehneis Absolutely. I've observed that a patient can do many things with a **myoelectric** or any other type **prosthesis**. He will demonstrate what he can do with it, but...  
...useful to the patient and what we consider is normal. In the case of the **myoelectric hand**, the pinching movement it provides is the essential action needed to have a **hand**. We can dream that perhaps special, small, **implantable electrodes** controlled by computers will give us a **hand** that can approximate the joint function capacity...The fitter marks a plumb line on the plastic socket to indicate positioning of the **prosthetic foot**,

usually about 7-8 cm from the center of the heel of the opposite foot...  
...DESCRIPTORS: **Artificial limbs** --

21/3,K/1 (Item 1 from file: 149)  
DIALOG(R)File 149:TGG Health&Wellness DB(SM)  
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01099733 SUPPLIER NUMBER: 04288930 (USE FORMAT 7 OR 9 FOR FULL TEXT)  
**Chips on the old block; microelectronic chips serve as newfangled tools for eavesdropping on brain chatter.**

Miller, Julie Ann  
Science News, v129, p408(2)  
June 28, 1986

PUBLICATION FORMAT: Magazine/Journal ISSN: 0036-8423 LANGUAGE: English  
RECORD TYPE: Fulltext TARGET AUDIENCE: Academic; Consumer  
WORD COUNT: 1370 LINE COUNT: 00134

... chip in the brain to communicate with brain cells in a semi-intelligent manner."

Such **electrodes** permanently **implanted** in the brain might be able to receive and generate electrical signals to bypass damaged...

...appropriate nerve cells or **muscles**. Pine also suggests that neurochips may be used to control **artificial limbs**.

But the work is only in early stages. "It's an art; there's no...

21/3,K/4 (Item 1 from file: 20)  
DIALOG(R)File 20:Dialog Global Reporter  
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03127332

**Brain powers into brave new world**

ABIX - AUSTRALASIAN BUSINESS INTELLIGENCE (WEST AUSTRALIAN) , p1  
October 16, 1998  
JOURNAL CODE: WTWA LANGUAGE: English RECORD TYPE: ABSTRACT  
WORD COUNT: 104

...in Atlanta hope the technology will eventually allow people who are completely paralysed to operate **artificial limbs**. The researchers developing the system for eight years tested it on monkeys before getting permission...

File 71:ELSEVIER BIOBASE 1994-2004/Nov W4  
File 315:ChemEng & Biotec Abs 1970-2004/Nov  
File 357:Derwent Biotech Res. 1982-2004/Dec W2  
File 358:Current BioTech Abs 1983-2004/Nov  
File 285:BioBusiness(R) 1985-1998/Aug W1  
File 583:Gale Group Globalbase(TM) 1986-2002/Dec 13

Set	Items	Description
S1	5960	ELECTROMYOGRA? OR MYOELECTRIC? OR EMG
S2	17754	ELECTRODES OR TRANSMITTERS
S3	68345	IMPLANT? OR SUBCUTANEOUS? OR SUBDERMAL? OR EPIM?SIUM OR EP- IM?SIA? OR INTRAMUSCULAR? OR INTRAFASCICUL? OR INTERFASCICUL?
S4	41163	ARTIFICIAL
S5	11023	PROSTHES?S OR PROSTHETIC?
S6	185833	ARM OR ARMS OR HAND OR HANDS OR LEG OR LEGS OR FOOT OR FEET OR LIMB OR LIMBS OR EXTREMITY OR EXTREMITIES
S7	116952	MUSCLE? OR MUSCULAR? OR FLEXOR OR EXTENSOR OR PRONATOR OR - SUPINATOR
S8	350	S4 (1W) S6 OR S5 (3N) S6
S9	1308	S2 (5N) S3
S10	0	S1 AND S8 AND S9
S11	1	S8 AND S9 [too recent]
S12	7136	DS
S13	0	S1 AND S2 AND S3 AND S8
S14	2	S2 AND S3 AND S8
S15	1	S14 NOT S11
S16	47	S1 AND S6 AND S2 AND S3
S17	39	S7 AND S16
S18	39	RD (unique items)
S19	19	S18/2000:2004
S20	20	S18 NOT S19
S21	47	S16 NOT (S11 OR S14)
S22	20	Sort S20/ALL/PY,A

15/7/1 (Item 1 from file: 285)  
DIALOG(R) File 285:BioBusiness(R)  
(c) 1998 BIOSIS. All rts. reserv.  
00053548

**MEET THE CAMPUS CAPITALISTS OF BIONIC VALLEY: THE UNIVERSITY OF UTAH**  
**NURTURES STARTUPS MAKING ARTIFICIAL HEARTS, ARMS , AND EARS.**

Atchison S D

Business Week No.2945, p.114-115, 1986.

ABSTRACT: Utah can be considered the state of biomedical engineering, largely due to Willem J. Kolff, retired director of the University of Utah's Institute for Biomedical Engineering and Division of Artificial Organs. Among biomedical companies set up through Kolff's aid is Motion Control, Inc., makers of the Utah Arm, the first to be activated by electrodes directly connected to the amputee's muscle remnants. Another company, Symbion Inc., was formed by Kolff and Robert K. Jarvick maker of the famous artificial hearts. Symbion is currently working on partial artificial hearts and has marketed a cochlear implant , which restores hearing in profoundly deaf people. These companies are providing jobs at a time when Utah's agriculture and mining demands are declining. Also, they are bringing tremendous amount of revenue to the state and more notably to the University which has accumulated \$2 million in stock ventures.

22/6/1 (Item 1 from file: 71)  
00077285 94051763  
Neural and biomechanical specializations of human thumb muscles revealed  
by matching weights and grasping objects  
PUBLICATION DATE: 19930000

22/6/2 (Item 2 from file: 71)  
00156933 94167921  
Coordination between head and hindlimb motions during the cat scratch  
response  
PUBLICATION DATE: 19940000

22/6/4 (Item 4 from file: 71)  
00325410 95149825  
Motor effects of stimulating the human cerebellar thalamus  
PUBLICATION DATE: 19950000

22/6/5 (Item 5 from file: 71)  
00322906 95149444  
Task-related variation in corticospinal output evoked by transcranial  
magnetic stimulation in the macaque monkey  
PUBLICATION DATE: 19950000

22/6/6 (Item 6 from file: 71)  
00277664 95099090  
Midbrain suppression of limb withdrawal and tail flick reflexes in the  
rat: Correlates with descending inhibition of sacral spinal neurons  
PUBLICATION DATE: 19950000

22/6/8 (Item 8 from file: 71)  
00490751 96184721  
A measure of peripheral nerve stimulation efficacy applicable to H-reflex  
studies  
PUBLICATION DATE: 19960000

22/6/9 (Item 9 from file: 71)  
00470270 96164225  
Hopping and swimming in the leopard frog, *Rana pipiens*: II. A comparison of  
muscle activities  
PUBLICATION DATE: 19960000

22/6/10 (Item 10 from file: 71)  
00445060 96138950  
Appropriately placed surface EMG electrodes reflect deep muscle  
activity (psoas, quadratus lumborum, abdominal wall) in the lumbar spine  
PUBLICATION DATE: 19960000

22/6/11 (Item 11 from file: 71)  
00416722 96110515  
The relationship of vibrissal motor cortex unit activity to whisking in the  
awake rat  
PUBLICATION DATE: 19960000

22/6/13 (Item 13 from file: 71)  
00678525 97185292

**Direct and indirect corticospinal control of arm and hand motoneurons  
in the squirrel monkey (Saimiri sciureus)**

PUBLICATION DATE: 19970000

22/6/15 (Item 15 from file: 71)  
01111087 1999074897

**Use and fibre type composition in limb muscles of cats**

22/6/17 (Item 17 from file: 71)  
00810008 1998046463

**Magnetic transcranial stimulation at intensities below active motor  
threshold activates intracortical inhibitory circuits**

PUBLICATION DATE: 19980000

22/6/18 (Item 18 from file: 71)  
01340414 2000007658

**Asymmetry of hindlimb muscle activity and cutaneous reflexes after tendon  
transfers in kittens**

22/6/19 (Item 19 from file: 71)  
01252849 1999229779

**Neurophysiological effects of stimulation through electrodes in the human  
subthalamic nucleus**

22/6/20 (Item 20 from file: 71)  
01082743 1999067259

**Direct demonstration of interhemispheric inhibition of the human motor  
cortex produced by transcranial magnetic stimulation**

22/7/3 (Item 3 from file: 71)  
DIALOG(R)File 71:ELSEVIER BIOBASE

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00154363 94152356

**Limited independent flexion of the thumb and fingers in human subjects**  
Kilbreath S.L.; Gandevia S.C.

ADDRESS: S.L. Kilbreath, School of Physiotherapy, Faculty of Health  
Sciences, The University of Sydney, Sydney, NSW 2036, Australia

Journal: Journal of Physiology, 479/3 (487-497), 1994, United Kingdom

PUBLICATION DATE: 19940000

CODEN: JPHYA

ISSN: 0022-3751

DOCUMENT TYPE: Article

LANGUAGES: English SUMMARY LANGUAGES: English

We investigated whether human subjects can activate selectively **flexor** pollicis longus (FPL) and digital portions of **flexor** digitorum profundus (FDP). These **muscles** were selected because they are the only **flexors** of the distal phalanges. **Electromyographic** activity ( **EMG** ) was recorded with **intramuscular electrodes** from one digital component of the deep **flexors** ('test') while subjects lifted weights by flexing the distal interphalangeal joint of the other digits in turn ('lifting' digits). Only recording sites at which single motor units were recruited selectively at low forces were used. The weights lifted represented 2.5-50% of the maximal voluntary contraction (MVC). We measured the lowest weight lifted which produced phasic and tonic coactivation in the 'test' **muscle**. The extent of coactivation varied with the 'distance' between the test and lifting

digits although no significant difference occurred in the pattern of coactivation thresholds among the digital **flexors**. The extent of coactivation increased when angular displacement or velocity at the distal interphalangeal joint of the lifting digit increased but was not critically dependent on restraint of the **hand**. Because mechanical 'connections' could interfere with the ability to move a distal phalanx independently, the **arms** of nine cadavers were studied. The separation of tendons between the thumb (FPL) and the index portion of FDP, and between the index and middle portions of FDP, usually extended more proximally in the **forearm** than separation between the tendons to the middle and ring fingers and between the ring and little fingers. Direct intertendinous links were also noted. It is not possible to direct a sufficiently focal motor command to flex selectively the distal joint of the fingers and thumb when forces exceeding 2.5% MVC are generated. For the middle, ring and little fingers in particular, movement of adjacent digits may also involve 'in-series' mechanical links between adjacent components of FDP.

22/7/7 (Item 7 from file: 71)

DIALOG(R)File 71:ELSEVIER BIOBASE

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00258946 95058052

**Differences and similarities in electrical muscle activity for the abductor pollicis longus muscle divisions**

Van Oudenaarde E.; Elvers J.W.H.; Gielen C.C.A.M.; Kauer J.M.G.; Oostendorp R.A.B.; Van der Straaten J.H.M.

ADDRESS: E. Van Oudenaarde, Weezenhof 62-37, 6536 AP Nijmegen, Netherlands

Journal: Journal of Electromyography and Kinesiology, 5/1 (57-64), 1995, United Kingdom

PUBLICATION DATE: 19950000

CODEN: JEKIE

ISSN: 1050-6411

DOCUMENT TYPE: Article

LANGUAGES: English SUMMARY LANGUAGES: English

The abductor pollicis longus (APL) has to be viewed as an important **muscle** for moving and stabilizing the human thumb. This **muscle** has two divisions, a distal superficial division and a more proximal deep one. The **electromyographic** ( **EMG** ) signals from these divisions were measured for several motor tasks in order to investigate differences in activation and function. **EMG** signals were recorded with **intramuscular** wire **electrodes** in isometric as well as in dynamic contractions in different directions, both for the thumb and for the **hand**. The **EMG** signals of the right **hand** of eight subjects were scaled relative to the mean **EMG** value at the maximum voluntary isometric contraction (MVC) in order to compare relative **muscle** activity in various directions for different subjects. In 18 out of the 22 directions the **EMG** activity in the two divisions of the APL was modulated differently, indicating a different activation. The differences were most prominent in dorsal and palmar flexion of the **hand**. The results suggested that the APLdeep is activated to stabilize the carpal joint. The APLdeep is a direct mover of the carpal joint in dorsal flexion of the **hand**.

22/7/12 (Item 12 from file: 71)

DIALOG(R)File 71:ELSEVIER BIOBASE

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00754958 97261587

**The influence of forearm, hand and thumb positions on extensor carpi**

**ulnaris and abductor pollicis longus activity**

Van Oudenaarde E.; Brandsma J.W.; Oostendorp R.A.B.

ADDRESS: E. Van Oudenaarde, Weezenhof 62-37, NL-6536 AP Nijmegen,  
Netherlands

Journal: Acta Anatomica, 158/4 (296-302), 1997, Switzerland

PUBLICATION DATE: 19970000

CODEN: ACATA

ISSN: 0001-5180

DOCUMENT TYPE: Article

LANGUAGES: English      SUMMARY LANGUAGES: English

NO. OF REFERENCES: 12

The objective of this study was to investigate the influence of forearm, hand and thumb positions on **electromyography** ( **EMG** ) activity of the abductor pollicis longus (APL) and the **extensor** carpi ulnaris (ECU) **muscles** . A second objective was to study the role of these **muscles** in stabilizing the wrist during movements of the thumb. This knowledge is important in clinical assessment and reconstructive surgery. At a constant force of 5 N for the thumb and 20 N for the hand , **EMG** activity was recorded with **intramuscular** wire **electrodes** in isometric and dynamic contractions in different positions and movements in the thumb and the hand . **EMG** activity of the right hand of 7 subjects was scaled relative to the mean **EMG** value at maximum voluntary isometric contraction to compare relative **muscle** activity in the tests. The results show that the position of the forearm does influence activity of the APL, but not of the ECU. The deep part of the APL shows differences in **EMG** activity between the positions of the forearm in dorsal flexion of the hand and the superficial part of the APL in palmar flexion of the hand . The ECU and the deep part of the APL are very active during movements and isometric contractions of the thumb. It is suggested that these **muscles** are necessary to stabilize the wrist during movements of the thumb to prevent undesired movements of the hand and the forearm.



File 155:MEDLINE(R) 1951-2004/Nov W4

S1 3400 'ARTIFICIAL LIMBS' OR DC='E7.695.50.' OR DC='E7.858.442.50-  
' OR R4:R13  
S2 687 'MYOELECTRIC COMPLEX, MIGRATING' OR DC='G10.261.482.570.' -  
OR DC='G11.561.450.100.570.' OR DC='G7.453.697.100.570.' OR '-  
MIGRATING MOTOR COMPLEX'  
S3 0 S1 AND S2  
S4 54009 MYOELECTRIC? OR ELECTROMYOGRA?  
S5 232 S1 AND S4  
S6 56231 ELECTROMYOGRA? OR MYOELECTRIC? OR EMG  
S7 49250 ELECTRODES OR TRANSMITTERS  
S8 293513 IMPLANT? OR SUBCUTANEOUS? OR SUBDERMAL? OR EPIM?SIUM OR EP-  
IM?SIA? OR INTRAMUSCULAR? OR INTRAFASCICUL? OR INTERFASCICUL?  
S9 148044 ARTIFICIAL  
S10 135327 PROSTHES?S OR PROSTHETIC?  
S11 456294 ARM OR ARMS OR HAND OR HANDS OR LEG OR LEGS OR FOOT OR FEET  
OR LIMB OR LIMBS OR EXTREMITY OR EXTREMITIES  
S12 531091 MUSCLE? OR MUSCULAR? OR FLEXOR OR EXTENSOR OR PRONATOR OR -  
SUPINATOR  
S13 236 S1 AND S6  
S14 9 S7 AND S8 AND S13

14/6/5

04856986 PMID: 616276

Exponential growth and future of artificial organs.

Aug 1977

14/7/4

DIALOG(R)File 155:MEDLINE(R)

(c) format only 2004 The Dialog Corp. All rts. reserv.

08682456 PMID: 2219554

[Improvement of prostheses and orthotic aids for the handicapped using  
electric stimulation and the registration of bioelectric signals]

Amelioration des protheses et aides orthotiques pour les handicapes au moyen  
de stimulation electrique et d'enregistrement des signaux bioelectriques

Stein R B; Capaday C

Departement de physiologie, faculte de medecine, Universite d'Alberta.

L'union medicale du Canada (CANADA) May-Jun 1990, 119 (3) p102-8,

ISSN 0041-6959 Journal Code: 0030444

Document type: Journal Article ; English Abstract

Languages: FRENCH

Main Citation Owner: NLM

Record type: Completed

Electro-mechanical devices can help a variety of patients with motor disabilities. Surface **EMG** from remaining **muscles** in an amputated **arm** can be used to control powered electronic **hands**, wrists and elbows. Sensory signals such as knee angle and ankle torque can be used to control the visco-elastic properties of a knee joint for above-knee amputees. Finally, **percutaneous electrodes** can be used to stimulate paralyzed **muscles** to replace **hand** function in quadriplegics and **leg** function in paraplegics. This article summarizes recent progress in each of these areas.

Record Date Created: 19901113

Record Date Completed: 19901113

14/7/6

DIALOG(R)File 155:MEDLINE(R)

(c) format only 2004 The Dialog Corp. All rts. reserv.

04310619 PMID: 985948

**[Development of powered prosthetic hands]**

Kato I; Tanaka S

Iyo denshi to seitai kogaku. Japanese journal of medical electronics and biological engineering (JAPAN) Feb 1976, 14 (1) p1-8, ISSN 0021-3292  
Journal Code: 17720370R

Document type: Journal Article

Languages: JAPANESE

Main Citation Owner: NLM

Record type: Completed

Record Date Created: 19761002

Record Date Completed: 19761002

14/7/7

DIALOG(R)File 155:MEDLINE(R)

(c) format only 2004 The Dialog Corp. All rts. reserv.

03758885 PMID: 4786757

**[Technical facilities for arm and hand function]**

Tekniska hjalpmedel for arm- och handfunktion.

Lakartidningen (SWEDEN) Aug 1 1973, 70 (31) p2731-9, ISSN 0023-7205  
Journal Code: 0027707

Document type: Journal Article

Languages: SWEDISH

Main Citation Owner: NLM

Record type: Completed

Record Date Created: 19740605

Record Date Completed: 19740605

14/7/8

DIALOG(R)File 155:MEDLINE(R)

(c) format only 2004 The Dialog Corp. All rts. reserv.

02595152 PMID: 5706883

**Implantation of micro-circuits for myo-electric control of prostheses.**

Herberts P; Kadefors R; Kaiser E; Petersen I

Journal of bone and joint surgery. British volume (ENGLAND) Nov 1968,  
50 (4) p780-91, ISSN 0301-620X Journal Code: 0375355

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: Completed

Record Date Created: 19690318

Record Date Completed: 19690318

14/7/9

DIALOG(R)File 155:MEDLINE(R)

(c) format only 2004 The Dialog Corp. All rts. reserv.

02595151 PMID: 5706882

**Development of a surgically implanted myo-telemetry control system.**

Tucker F R; Scott R N

Journal of bone and joint surgery. British volume (ENGLAND) Nov 1968,  
50 (4) p771-9, ISSN 0301-620X Journal Code: 0375355

Document type: Journal Article

Languages: ENGLISH

ASRC Searcher: Jeanne Horrigan  
Serial 10/069559  
December 6, 2004

24

Main Citation Owner: NLM  
Record type: Completed  
Record Date Created: 19690318  
Record Date Completed: 19690318

File 149:TGG Health&Wellness DB(SM) 1976-2004/Nov W1  
File 16:Gale Group PROMT(R) 1990-2004/Dec 07  
File 148:Gale Group Trade & Industry DB 1976-2004/Dec 06  
File 98:General Sci Abs/Full-Text 1984-2004/Sep  
File 370:Science 1996-1999/Jul W3  
File 20:Dialog Global Reporter 1997-2004/Dec 07  
File 35:Dissertation Abs Online 1861-2004/Nov

Set	Items	Description
S1	138	TRANSDUCER?(S) (ELECTROMYOGRA? OR MYOELECTRIC? OR EMG)
S2	10935	ELECTROMYOGRA? OR MYOELECTRIC? OR EMG
S3	72001	ELECTRODES OR TRANSMITTERS
S4	147738	IMPLANT? OR SUBCUTANEOUS? OR SUBDERMAL? OR EPIM?SIUM OR EP- IM?SIA? OR INTRAMUSCULAR? OR INTRAFASCICUL? OR INTERFASCICUL?
S5	258917	ARTIFICIAL
S6	26108	PROSTHES?S OR PROSTHETIC?
S7	6258954	ARM OR ARMS OR HAND OR HANDS OR LEG OR LEGS OR FOOT OR FEET OR LIMB OR LIMBS OR EXTREMITY OR EXTREMITIES
S8	341647	MUSCLE? OR MUSCULAR? OR FLEXOR OR EXTENSOR OR PRONATOR OR - SUPINATOR
S9	11	S1(S)S4
S10	7393	S5(1W)S7 OR S6(3N)S7
S11	0	S9 AND S10
S12	1	S9/2000:2004
S13	10	S9 NOT S12
S14	10	RD (unique items) [not relevant]

File 155:MEDLINE(R) 1951-2004/Nov W4  
File 5:Biosis Previews(R) 1969-2004/Nov W3  
File 73:EMBASE 1974-2004/Nov W4  
File 34:SciSearch(R) Cited Ref Sci 1990-2004/Nov W4  
File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec  
File 144:Pascal 1973-2004/Nov W4  
File 2:INSPEC 1969-2004/Nov W4  
File 6:NTIS 1964-2004/Nov W4  
File 8:Bi Compendex(R) 1970-2004/Nov W4  
File 35:Dissertation Abs Online 1861-2004/Nov  
File 94:JICST-EPlus 1985-2004/Oct W5  
File 95:TEME-Technology & Management 1989-2004/Jun W1  
File 99:Wilson Appl. Sci & Tech Abs 1983-2004/Oct  
File 71:ELSEVIER BIOBASE 1994-2004/Nov W4  
File 285:BioBusiness(R) 1985-1998/Aug W1

Set	Items	Description
S1	1673	TRANSDUCER? ? AND (ELECTROMYOGRA? OR MYOELECTRIC)
S2	207825	ELECTROMYOGRA? OR MYOELECTRIC? OR EMG
S3	572726	ELECTRODES OR TRANSMITTERS
S4	1504910	IMPLANT? OR SUBCUTANEOUS? OR SUBDERMAL? OR EPIM?SIUM OR EP- IM?SIA? OR INTRAMUSCULAR? OR INTRAFASCICUL? OR INTERFASCICUL?
S5	1042647	ARTIFICIAL
S6	415261	PROSTHES?S OR PROSTHETIC?
S7	2541763	ARM OR ARMS OR HAND OR HANDS OR LEG OR LEGS OR FOOT OR FEET OR LIMB OR LIMBS OR EXTREMITY OR EXTREMITIES
S8	2910516	MUSCLE? OR MUSCULAR? OR FLEXOR OR EXTENSOR OR PRONATOR OR - SUPINATOR
S9	1904	TRANSDUCER? AND S2
S10	19383	S5(1W)S7 OR S6(3N)S7

S11 0 S4(S)S9(S)S10  
S12 1 S4 AND S9 AND S10

12/7/1 (Item 1 from file: 155)

DIALOG(R)File 155:MEDLINE(R)

(c) format only 2004 The Dialog Corp. All rts. reserv.

08040804 PMID: 3506808

Sensory control of a multifunction **hand prosthesis** .

Kyberd P J; Chappell P H; Nightingale J M

Department of Electrical Engineering, University of Southampton, UK.

Biosensors (ENGLAND) 3 (6) p347-57, ISSN 0265-928X Journal Code:

8601088

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: Completed

The current generation of **prostheses** that are fitted to **limb** deficient individuals have only a single degree of freedom which limits their functional range. Furthermore, electrically powered **prostheses** have a limited user input. Electrical signals generated by the contraction of **muscles** in the user's stump open and close the **hand** in an 'on and off' fashion. Since the only feedback is visual, the **prostheses** tend to be used less dexterously than body powered devices. A different approach has been adopted by the Control Engineering Group at Southampton University. They have retained a single **electromyographic** input channel, but added sensory feedback to an electronic controller, which decides on the grip posture and tension. Satisfactory operation of the **hand** depends on the sensors employed. A review of **transducers** used on previous **prostheses** at Southampton is followed by a description of recent sensor developments. Finally the intentions for a new generation of **prostheses** are outlined. These include combining sensory input with an integrated circuit microcontroller to provide a more reliable system.

Record Date Created: 19890405

Record Date Completed: 19890405

File 350:Derwent WPIX 1963-2004/UD,UM &UP=200478

File 347:JAPIO Nov 1976-2004/Aug(Updated 041203)

Set	Items	Description
S1	855	ELECTROMYOGRA? OR MYOELECTRIC? OR EMG
S2	412491	ELECTRODES OR TRANSMITTERS
S3	168185	IMPLANT? OR SUBCUTANEOUS? OR SUBDERMAL? OR EPIM?SIUM OR EP- IM?SIA? OR INTRAMUSCULAR? OR INTRAFASCICUL? OR INTERFASCICUL?
S4	82265	ARTIFICIAL
S5	20408	PROSTHES?S OR PROSTHETIC?
S6	1054047	ARM OR ARMS OR HAND OR HANDS OR LEG OR LEGS OR FOOT OR FEET OR LIMB OR LIMBS OR EXTREMITY OR EXTREMITIES
S7	41927	MUSCLE? OR MUSCULAR? OR FLEXOR OR EXTENSOR OR PRONATOR OR - SUPINATOR
S8	336	IC=(A61F-002/72 OR A61F-004?)
S9	252748	IC=A61B?
S10	2609	S4(1W)S6 OR S5(3N)S6
S11	5989	S2(S)S3
S12	1	S1 AND S10 AND S11 [a duplicate]
S13	6	S10 AND S11
S14	5	S13 NOT S12
S15	3	S8 AND S11
S16	0	S15 NOT S12:S13
S17	137	S11 AND S7
S18	8	S11 AND S1
S19	7	S18 NOT S12:S13
S20	1	S1 AND S2 AND S3 AND S10
S21	0	S20 NOT (S12:S13 OR S18)

14/34/2 (Item 2 from file: 350)

DIALOG(R)File 350:Derwent WPIX

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015419937 \*\*Image available\*\*

WPI Acc No: 2003-482077/200345

**Real time closed loop brain-machine interface for restoring voluntary motor control and sensory feedback to a subject, includes electrodes, signal processing mechanism, and actuator**

Patent Assignee: UNIV DUKE (UYDU-N); CHAPIN J K (CHAP-I); NICOLELIS M A L (NICO-I); WESSBERG J (WESS-I)

Inventor: CHAPIN J K; NICOLELIS M A; WESSBERG J; NICOLELIS M A L

Number of Countries: 102 Number of Patents: 004

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
WO 200337231	A1	20030508	WO 2002US31269	A	20021001	200345 B
US 20030093129	A1	20030515	US 200112012	A	20011029	200345
EP 1448121	A1	20040825	EP 2002782089	A	20021001	200456
			WO 2002US31269	A	20021001	
AU 2002348482	A1	20030512	AU 2002348482	A	20021001	200464

Priority Applications (No Type Date): US 200112012 A 20011029

Patent Details:

Patent No Kind Lan Pg Main IPC Filing Notes

WO 200337231 A1 E 110 A61F-004/00

Designated States (National): AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA  
CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN  
IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ  
OM PH PL PT RO RU SD SE SG SI SK SL TJ TM TN TR TT TZ UA UG US UZ VC VN

YU ZA ZM ZW

Designated States (Regional): AT BE BG CH CY CZ DE DK EA EE ES FI FR GB  
GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SK SL SZ TR TZ UG ZM ZW

US 20030093129 A1 A61N-001/08

EP 1448121 A1 E A61F-004/00 Based on patent WO 200337231

Designated States (Regional): AL AT BE BG CH CY CZ DE DK EE ES FI FR GB  
GR IE IT LI LT LU LV MC MK NL PT RO SE SI SK TR

AU 2002348482 A1 A61F-004/00 Based on patent WO 200337231

Abstract (Basic): WO 200337231 A1

NOVELTY - A real time closed loop brain-machine interface comprises **electrodes** to acquire extra-cellular electrical signals from a population of single neurons, a signal processing mechanism to form extracted motor commands from the electrical signals, and an actuator to respond to the extracted motor commands and to provide sensory feedback to the subject

DETAILED DESCRIPTION - A real time closed loop brain-machine interface comprises **electrodes** to be chronically **implanted** in the nervous system of a subject (5) and to acquire extra-cellular electrical signals from a population of single neurons, a signal processing mechanism to communicate with the **electrodes** and to form extracted motor commands from the electrical signals, and an actuator to communicate with the processing mechanism and to respond to the extracted motor commands by effecting a movement and to provide sensory feedback to the subject.

An INDEPENDENT CLAIM is also included for:

(a) a method of controlling an actuator and imparting voluntary motor control and sensory feedback to a subject by neural signals, comprising ; extracting a motor command from processed neural signals, transmitting the extracted command to an actuator, acquiring and interpreting sensory feedback information, and relaying the interpreted information back to the subject.

USE - For restoring voluntary motor control and sensory feedback to a subject who has lost a degree of voluntary motor control and sensory feedback.

ADVANTAGE - The invention can translate neural signals in the brain of a subject into movement of an external device, and can operate continuously or discontinuously at the subject's discretion.

DESCRIPTION OF DRAWING(S) - The figure shows a schematic drawing of a brain-machine interface.

Subject (5)

Cable (85)

pp; 110 DwgNo 1A/4

Technology Focus:

TECHNOLOGY FOCUS - METALLURGY - Preferred Material: The **electrodes** comprise microwires made from stainless steel, platinum, or tungsten.

POLYMERS - Preferred Material: The microwires are TEFLON coated.

INSTRUMENTATION AND TESTING - Preferred Component: The microwires are oriented in a definite spatial relationship relative to one another to form a microwire array comprising 16-128 microwires or a microwave bundle. The signal processing mechanism comprises neurochip(s) to be chronically **implanted** in the body of a subject, a data acquisition module in communication with the neurochips, a motor command extraction module, and a power supply. The neurochips are sealed with an insulating material to prevent contact with blood or tissue. The actuator comprises a **prosthetic limb**. The communication between the

neurochips and data acquisition module is through a cable (85).

Preferred Property: The microwires have a diameter of 50, preferably 25-50 microm. The difference in length between a first wire tip and a second wire tip is 150-300 microm.

INORGANIC CHEMISTRY - Preferred Material: The insulating material is aluminum trioxide. The power supply comprises a lithium battery

Derwent Class: A85; P32; S05; T01; T06

International Patent Class (Main): A61F-004/00; A61N-001/08

International Patent Class (Additional): A61N-001/10; A61N-001/18;

A61N-001/20; A61N-001/32; A61N-001/34; A61N-001/40

14/34/4 (Item 4 from file: 350)

DIALOG(R) File 350:Derwent WPIX

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013773122 \*\*Image available\*\*

WPI Acc No: 2001-257333/200126

**Electric stimulation system for limb stump of amputee, has electrical signal generator which provides electrical signals to electrodes implanted in limb stump to provide electrical stimulation to nerve**

Patent Assignee: NEUROSTREAM TECHNOLOGIES INC (NEUR-N)

Inventor: HOFFER J A

Number of Countries: 095 Number of Patents: 004

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
WO 200102054	A2	20010111	WO 2000CA789	A	20000705	200126 B
AU 200056692	A	20010122	AU 200056692	A	20000705	200130
EP 1196217	A2	20020417	EP 2000941857	A	20000705	200233
			WO 2000CA789	A	20000705	
JP 2003503166	W	20030128	WO 2000CA789	A	20000705	200309
			JP 2001507542	A	20000705	

Priority Applications (No Type Date): US 99142983 P 19990706

Patent Details:

Patent No Kind Lan Pg Main IPC Filing Notes

WO 200102054 A2 E 29 A61N-001/34

Designated States (National): AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW

Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TZ UG ZW

AU 200056692 A A61N-001/34 Based on patent WO 200102054

EP 1196217 A2 E A61N-001/34 Based on patent WO 200102054

Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI

JP 2003503166 W 32 A61F-002/02 Based on patent WO 200102054

Abstract (Basic): WO 200102054 A2

NOVELTY - **Electrodes** (14) are **implanted** in the **limb** stump (10) of an amputee such that the **electrodes** are placed in a close proximity to a severed sensory nerve (20) in the **limb** stump to provide an electrical stimulation to the nerve upon receiving the supplied current. An electrical signal generator (12) provides and varies the electrical signals to each electrode.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(a) an amputee's phantom **limb** pain alleviating method;



- (b) a sensory feedback providing system;
- (c) and a sensory feedback providing method.

USE - For treatment of phantom **limb** pain of amputee having **limb** stump.

ADVANTAGE - Enables alleviating phantom **limb** pain of amputee and replacing lost sensory function from missing **limb**. Suppresses central perception of pain information in small-diameter fibers when there is an absence of activity that normally occur in large-diameter sensory fibers, hence attaining pain sensation to reach consciousness. Enables restoring normal balance of activity in large and small diameter fibers which counterbalance the excessive flow of pain information in central pathways. Ensures effective treatment of phantom **limb** pain of amputee.

DESCRIPTION OF DRAWING(S) - The figure shows the schematic view of amputee's **limb** stump and a **prosthetic limb** having electric stimulation system.

**Limb** stump (10)

Electrical signal generator (12)

**Electrodes** (14)

Sensory nerve (20)

pp; 29 DwgNo 1/3

Derwent Class: P32; P34; S05

International Patent Class (Main): A61F-002/02; A61N-001/34

**19/26, TI/3** (Item 3 from file: 350)

DIALOG(R) File 350: Derwent WPIX

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016271550

WPI Acc No: 2004-429444/200440

**Treatment of patient with neoplastic disease involves delivering electrical stimulation in the form of direct electric current and/or periodic waveform**

**19/34/1** (Item 1 from file: 350)

DIALOG(R) File 350: Derwent WPIX

(c) 2004 Thomson Derwent. All rts. reserv.  
016384129

WPI Acc No: 2004-542036/200452

**Method for implanting electromyographic electrodes into striated muscles under experimental conditions**

Patent Assignee: TVER MED AKAD (TVER-R)

Inventor: ELISEEV A V; KROMIN A A; STRAKHOV M A

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
RU 2231308	C1	20040627	RU 2003100978	A	20030113	200452 B

Priority Applications (No Type Date): RU 2003100978 A 20030113

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
RU 2231308	C1		A61B-017/00	

Abstract, (Basic): RU 2231308 C1

NOVELTY - Method involves immobilizing an animal after a period of fastening, fixing it with its cheek upward, shorn and shaved cheek is treated with 5% iodine solution in ethyl alcohol and layer-by-layer cutting tissues in the cheek area near the upper one-third of chewer **muscle** close to anterior edge under local transverse section anesthesia with 2% Novocain solution. Fascia is cut with 7 mm long incision in

parallel to **muscle** fibers, separating the **muscle** fibers bluntly to build **muscle** pocket of 4mm x 4mm dimensions to which electrode is brought. Then, atraumatic needle is introduced into the **muscle** 2-3 mm proximal relative to **muscle** pocket apex and to the right and left of the **muscle** pocket. The needle is brought out through the pocket into the incision in the **muscle**. Needle pierce out is carried out through the **muscle** pocket 2 mm far from pierce in place. Electrode substrate is pulled in into the **muscle** pocket. Three isolated sutures are tied on **muscle** surface. Wires are brought out by means of trocar to cranium surface scalped in advance. The wires are soldered to standard connection unit and sealed with fast-hardening plastic.

USE - Medicine.

ADVANTAGE - High reliability of obtained experimental results.

pp; 0 DwgNo 0/0

Derwent Class: P31; P85; S05

International Patent Class (Main): A61B-017/00

International Patent Class (Additional): G09B-023/28

File 348:EUROPEAN PATENTS 1978-2004/Nov W04

File 349:PCT FULLTEXT 1979-2002/UB=20041202,UT=20041125

Set	Items	Description
S1	1835	ELECTROMYOGRA? OR MYOELECTRIC? OR EMG
S2	134064	ELECTRODES OR TRANSMITTERS
S3	148239	IMPLANT? OR SUBCUTANEOUS? OR SUBDERMAL? OR EPIM?SIUM OR EP- IM?SIA? OR INTRAMUSCULAR? OR INTRAFASCICUL? OR INTERFASCICUL?
S4	64481	ARTIFICIAL
S5	19917	PROSTHES?S OR PROSTHETIC?
S6	803664	ARM OR ARMS OR HAND OR HANDS OR LEG OR LEGS OR FOOT OR FEET OR LIMB OR LIMBS OR EXTREMITY OR EXTREMITIES
S7	69725	MUSCLE? OR MUSCULAR? OR FLEXOR OR EXTENSOR OR PRONATOR OR - SUPINATOR
S8	81	IC=(A61F-002/72 OR A61F-004?)
S9	57101	IC=A61B?
S10	1165	S4(1W)S6 OR S5(3N)S6
S11	2620	S2(5N)S3
S12	4	S10(S)S11
S13	97	S11(5N)S7
S14	3	S10 AND S13
S15	3	S14 NOT S12 [2 duplicates; 1 not relevant]
S16	11	S10(S)S2(S)S3
S17	7	S16 NOT (S12 OR S14)

12/6/2 (Item 2 from file: 349)  
00768797 \*\*Image available\*\*  
**ELECTRICAL STIMULATION SYSTEM FOR TREATING PHANTOM LIMB PAIN**

12/3,K/3 (Item 3 from file: 349)  
DIALOG(R)File 349:PCT FULLTEXT  
(c) 2004 WIPO/Univentio. All rts. reserv.  
00545635 \*\*Image available\*\*  
**SYSTEM AND METHODS FOR CONTROLLING DEVICES BY BRAIN SIGNALS**  
**SYSTEMES ET PROCEDES DE COMMANDE DE DISPOSITIFS PAR DES SIGNAUX PROVENANT**  
**DU CERVEAU**

Patent Applicant/Assignee:

EMORY UNIVERSITY,

Inventor(s):

HUMPHREY Donald R,

Patent and Priority Information (Country, Number, Date):

Patent: WO 200009008 A1 20000224 (WO 0009008)

Application: WO 99US18172 19990811 (PCT/WO US9918172)

Priority Application: US 98135249 19980817

Designated States:

(Protection type is "patent" unless otherwise stated - for applications prior to 2004)

AU CA JP AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE

Publication Language: English

Fulltext Word Count: 12524

Fulltext Availability: Detailed Description

Detailed Description

... device according to a preferred embodiment of the present invention.  
Here the control of an **artificial limb**, or of stimulation of  
paralyzed **muscles** of the **limb**, to produce a  
particular motion is...

...is assumed in this 23  
description that two prior conditions have been met. First, the  
**electrodes** have been **implanted** in brain regions that have been shown  
with functional imaging procedures to be under the...

17/6/3 (Item 2 from file: 349)

00969382 \*\*Image available\*\*

**PROCESS TO CREATE ARTIFICIAL NERVES FOR BIOMECHANICAL SYSTEMS USING OPTICAL  
WAVEGUIDE NETWORK**

17/3,AB,K/2 (Item 1 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT

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01095915

**CONTROL SYSTEM AND METHOD FOR CONTROLLING AN ACTUATED PROSTHESIS  
SYSTEME DE COMMANDE ET PROCEDE POUR COMMANDER UNE PROTHESE ACTIONNEE**

Patent Applicant/Assignee:

VICTHOM HUMAN BIONICS INC, 4780, rue Saint-Felix, Bureau 105,  
Saint-Augustin-de-Desmaures, Quebec G3A 2J9, CA, CA (Residence), CA  
(Nationality)

Inventor(s):

BEDARD Stephane, 256, rue du Tonnelier, Saint-Augustin-de-Desmaures,  
Quebec G3A 2K5, CA,

Legal Representative:

MCCARTHY TETRAULT LLP (agent), Pellemans, Nicolas, Le Windsor, 1170 Peel  
Street, Montreal, Quebec H3B 4S8, CA,

Patent and Priority Information (Country, Number, Date):

Patent: WO 200417873 A1 20040304 (WO 0417873)

Application: WO 2003CA937 20030620 (PCT/WO CA03000937)

Priority Application: US 2002405281 20020822; US 2002424261 20021106; US  
2003453556 20030311

Designated States:

(Protection type is "patent" unless otherwise stated - for applications  
prior to 2004)

AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ  
EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR  
LS LT LU LV MA MD MG MK MN MW MX MZ NI NO NZ OM PG PH PL PT RO RU SC SD  
SE SG SK SL TJ TM TN TR TT TZ UA UG UZ VC VN YU ZA ZM ZW  
(EP) AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL PT RO SE  
SI SK TR  
(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG  
(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW  
(EA) AM AZ BY KG KZ MD RU TJ TM

Publication Language: English

Filing Language: English

Fulltext Word Count: 17106

English Abstract

The method and the control system are used for determining a portion of  
locomotion and a phase of locomotion portion in view of controlling an  
actuated **prosthesis** in real time. Accordingly, the method comprises  
receiving a data signal from a plurality of main **artificial**  
proprioceptors (16), obtaining a first and a second derivative signal for  
each data signal, obtaining a third derivative signal for at least one of  
the data signals, using a set of a first state machines to select one  
state among a plurality of possible states for each **artificial**

proprioceptor with the corresponding data and derivative signals, generating the phase of locomotion portion using the states of the main **artificial** proprioceptors; and using a second state machine to select the portion of locomotion among a plurality of possible portions of locomotion using events associated to the data signals. It is particularly well adapted for the control of an actuated **leg prosthesis** (12) **for above-knee amputees**.

Fulltext Availability: Detailed Description  
Detailed Description

... the **prosthesis** knee joint. The plantar pressure sensors are used under both **feet**, including the **artificial foot**. It could also be used under two **artificial feet** if required. One of the gyroscope is located at the shank of the normal **leg**...  
...**artificial** proprioceptors (16) are neuro-sensors which measure the action potential of motor nerves, **myoelectrical electrodes** which measure the internal or the external **myoelectrical** activity of **muscles**, needle matrix **implants** which measure the cerebral activity of specific region of the cerebrum cortex such as motor...

17/3,AB,K/5 (Item 4 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT

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00458276

**ARTIFICIAL SENSIBILITY**

**SENSIBILITE ARTIFICIELLE**

Patent Applicant/Assignee:

**HAND** MEDIC HB,  
LUNDBORG Goran,

Inventor(s):

LUNDBORG Goran,

Patent and Priority Information (Country, Number, Date):

Patent: WO 9848740 A1 19981105

Application: WO 98SE786 19980429 (PCT/WO SE9800786)

Priority Application: SE 971595 19970429

Designated States:

(Protection type is "patent" unless otherwise stated - for applications prior to 2004)

AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GE GH GM  
GW HU ID IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX  
NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG US UZ VN YU ZW GH  
GM KE LS MW SD SZ UG ZW AM AZ BY KG KZ MD RU TJ TM AT BE CH CY DE DK ES  
FI FR GB GR IE IT LU MC NL PT SE BF BJ CF CG CI CM GA GN ML MR NE SN TD TG

Fulltext Word Count: 2332

English Abstract

Loss or absence of sensibility in the **hand**, **foot** or other part of the body can constitute a severe **handicap** after injury or in disease. Also when **hand prostheses** are used following amputation, injuries lack of sensibility in the **prostheses** constitutes a major problem. The prevailing invention refers to a new principle for **artificial** sensibility by sense substitution (replacement of a lost sense function by utilization of an alternate sense). The primary aim is to, by using the hearing sense, achieve sensibility in **hand prostheses** or **hands** which have lost their sensibility by injury or disease. According to this principle vibrotactile stimuli to the fingers are registered by sensors of microphone type, placed at finger level, the signals being processed and

transformed into acoustic stimuli. By using this principle the patient can "feel with the hearing sense" hereby utilizing the hearing sense to register and identify the surface, texture, density and shape of the item which is touched.

Fulltext Availability: Detailed Description

Detailed Description

... sensibility would be of great importance. A review a number of such situations follows below:

#### **Hand prostheses**

Following amputation injuries at forearm or upper arm level the patient can have good use of an "artificial hand", i.e. a hand prosthesis can replacing the amputated hand. Such a hand prosthesis can be fixed to the amputation stump ...part of the forearm (amputation stump, or by titanium fixtures (according to Branemark) which are implanted into the skeleton. The prosthesis can be of cosmetic nature without possibilities for movement, or...

...are controlled by electric activity in muscles which remain in the amputation stump. By surface electrodes in the sleeve, enclosing the amputation stump, such impulses in extensor or flexor muscles can in the prosthesis which can open or close the prosthetic hand

Myoelectric hand prostheses can be very useful, but many patients use their prostheses only to a limited extent...

File 350:Derwent WPIX 1963-2004/UD,UM &UP=200478

File 347:JAPIO Nov 1976-2004/Aug(Updated 041203)

Set Items Description

S1 855 ELECTROMYOGRA? OR MYOELECTRIC? OR EMG  
S2 412491 ELECTRODES OR TRANSMITTERS  
S3 168185 IMPLANT? OR SUBCUTANEOUS? OR SUBDERMAL? OR EPIM?SIUM OR EP-  
IM?SIA? OR INTRAMUSCULAR? OR INTRAFASCICUL? OR INTERFASCICUL?  
S4 82265 ARTIFICIAL  
S5 20408 PROSTHES?S OR PROSTHETIC?  
S6 1054047 ARM OR ARMS OR HAND OR HANDS OR LEG OR LEGS OR FOOT OR FEET  
OR LIMB OR LIMBS OR EXTREMITY OR EXTREMITIES  
S7 41927 MUSCLE? OR MUSCULAR? OR FLEXOR OR EXTENSOR OR PRONATOR OR -  
SUPINATOR  
S8 111303 TRANSDUCER? ?  
S9 104842 S8 NOT S2  
S10 12 S1 AND S9  
S11 1 S3 AND S10 [not relevant]  
S12 1 S10 AND S6 [not relevant]  
S13 10 S10 NOT S11:S12

13/26, TI/10 (Item 10 from file: 350)

DIALOG(R)File 350:Derwent WPIX

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002092936

WPI Acc No: 1979-B2825B/197906

Linear electromyographic bio-feedback system - has third order  
averaging filter providing signal representative of instantaneous value  
of muscle activity, to control oscillator

13/7/9 (Item 9 from file: 350)

DIALOG(R)File 350:Derwent WPIX

(c) 2004 Thomson Derwent. All rts. reserv.

009512169 \*\*Image available\*\*

WPI Acc No: 1993-205705/199325

Control system for myoelectric prosthesis for below-the-elbow amputees -  
generates sensing signal associated with movement of body part and linearises  
signal to be linear function of magnitude of distance moved by body part  
Patent Assignee: NASA US NAT AERO & SPACE ADMIN (USAS )  
Inventor: BOZEMAN R J

Number of Countries: 001 Number of Patents: 004

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US N7937325	N	19930601	US 92937325	A	19920831	199325 B
US 5376128	A	19941227	US 92937325	A	19920831	199506
US 5458655	A	19951017	US 92937325	A	19920831	199547
			US 94283474	A	19940726	
US 5480454	A	19960102	US 92937325	A	19920831	199607
			US 94282843	A	19940726	

Priority Applications (No Type Date): US 92937325 A 19920831; US 94283474 A  
19940726; US 94282843 A 19940726

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US N7937325	N		24	A61F-000/00	
US 5376128	A		11	A61F-002/54	
US 5458655	A		11	A61F-002/54	Div ex application US 92937325

US 5480454      A      11 A61F-002/54      Div ex patent US 5376128  
Div ex application US 92937325  
Div ex patent US 5376128

Abstract (Basic): US N7937325 N

The control system for **prosthetic** devices includes a **transducer** for receiving movement from a body part for generating a sensing signal associated with the movement. The sensing signal is processed for linearising the sensing signal to be a linear function of the magnitude of the distance moved by the body part. The linearised sensing signal is normalised to be a function of the entire range of body part movement from the no-shrug position of the moveable body part through the full-shrug position of the moveable body part.

The normalised signal is divided into a number of discrete command signals. The discrete command signals are used by typical converter devices which operate the **prosthetic** device. The converter devices uses the discrete command signals for driving the moveable portions of the **prosthetic** device and its sub-**prosthesis**.

USE/ADVANTAGE - Easy-to-use ''shrug'' techniques generate discrete finger digit control and wrist rotation, control system can be easily mounted in body of **prosthetic** devices, conformal printed circuit-type conductors can be employed, improved maintenance, individual finger digital control is proposed instead of hook with cable actuation, wrist rotation capability, hardware programmable, use of frictional forces for actuation.

Dwg.4/5

US 7937325 N

The control system for **prosthetic** devices includes a **transducer** for receiving movement from a body part for generating a sensing signal associated with the movement. The sensing signal is processed for linearising the sensing signal to be a linear function of the magnitude of the distance moved by the body part. The linearised sensing signal is normalised to be a function of the entire range of body part movement from the no-shrug position of the moveable body part through the full-shrug position of the moveable body part.

The normalised signal is divided into a number of discrete command signals. The discrete command signals are used by typical converter devices which operate the **prosthetic** device. The converter devices uses the discrete command signals for driving the moveable portions of the **prosthetic** device and its sub-**prosthesis**.

USE/ADVANTAGE - Easy-to-use ''shrug'' techniques generate discrete finger digit control and wrist rotation, control system can be easily mounted in body of **prosthetic** devices, conformal printed circuit-type conductors can be employed, improved maintenance, individual finger digital control is proposed instead of hook with cable actuation, wrist rotation capability, hardware programmable, use of frictional forces for actuation.

Dwg.4/5

US 7937325 A

The control system for **prosthetic** devices includes a **transducer** for receiving movement from a body part for generating a sensing signal associated with the movement. The sensing signal is processed for linearising the sensing signal to be a linear function of the magnitude of the distance moved by the body part. The linearised sensing signal is normalised to be a function of the entire range of body part movement from the no-shrug position of the moveable body part through



the full-shrug position of the moveable body part.

The normalised signal is divided into a number of discrete command signals. The discrete command signals are used by typical converter devices which operate the **prosthetic** device. The converter devices uses the discrete command signals for driving the moveable portions of the **prosthetic** device and its sub-**prosthesis**.

USE/ADVANTAGE - Easy-to-use 'shrug' techniques generate discrete finger digit control and wrist rotation, control system can be easily mounted in body of **prosthetic** devices, conformal printed circuit-type conductors can be employed, improved maintenance, individual finger digital control is proposed instead of hook with cable actuation, wrist rotation capability, hardware programmable, use of frictional forces for actuation.

Dwg.4/5

Abstract (Equivalent): US 5480454 A

A control system for use with a **prosthetic** device, the **prosthetic** device comprising a plurality of moveable sub-**prostheses** and incorporating any implementation of harness and shoulder control hardware such that the shoulder shrug control movement associated with a moveable body part ranging from the no-shrug position of the moveable body part through the full-shrug position of the moveable body part provides control by the user to the **prosthetic** device, the control system comprising:

- (a) a shoulder harness for engaging the body part and for receiving the movement from the body part,

- (b) a linear potentiometer for mechanically receiving the movement from said shoulder harness and for generating a linear sensing signal in consonance with the movement of the body part,

- (c) an attenuator potentiometer for receiving the linear sensing signal from said linear potentiometer and for scaling the linear sensing signal to be a function of the entire range of body part movement from the no-shrug position of the moveable body part through the full-shrug position of the moveable body part,

- (d) a bar graph driver circuit for receiving the scaled linear signal from said attenuator potentiometer and for dividing the scaled signal into a plurality of discrete command signals,

- (e) current driver means operatively associated with said bar graph driver circuit for receiving the discrete command signals from said bar graph driver circuit and for generating electrical drive signals, corresponding to said command signals, and

- (f) a solenoid/motor arrangement for receiving the drive signals from said current driver means and controlling each of said moveable sub-**prosthesis** of the **prosthetic** device by a different one of said drive signals.

Dwg.4/5

US 5458655 A

A method for controlling a **prosthetic** device, the **prosthetic** device comprising a plurality of moveable sub-**prostheses** and incorporating any implementation of harness and shoulder control hardware such that the shoulder shrug control movement associated with a moveable body part ranging from the no-shrug position of the moveable body part through the full-shrug position of the moveable body part provides control by the user to the **prosthetic** device, the method for controlling the **prosthetic** device comprising the steps of:

- (a) receiving the movement from the body part,

(b) generating a sensing signal in consonance with the movement of the body part,

(c) linearising the sensing signal to be a linear function of the magnitude of the distance moved by the body part,

(d) normalizing the linear signal to be a function of the entire range of body part movement from the no-shrug position of the moveable body part through the full-shrug position of the moveable body part,

(e) dividing the normalized signal into a plurality of discrete command signals, and

(f) implementing the plurality of discrete command signals for driving a respective one of said plurality of moveable sub-**prostheses** of the **prosthetic** device.

Dwg.4/5

US 5376128 A

The control comprises a **transducer** for generating at least one sensing signal in consonance with the movement of the body part. A lineariser is configured to receive the sensing signal from the **transducer** and to linearise the sensing signal to be a linear function of the magnitude of the distance moved by the body part. A normaliser is associated with the lineariser for receiving the linear signal from the lineariser and for normalising the linear signal to be a function of the entire range of body part movement from the no-shrug position of the moveable body part through the full-shrug position of the moveable body part. A normaliser is associated with the lineariser for receiving the linear signal from the lineariser and for normalising the linear signal to be a function of the entire range of body part movement from the no-shrug position of the moveable body part through the full-shrug position of the moveable body part.

A discriminator is configured to receive the normalised signal from the normaliser for dividing the normalised signal into discrete command signals.

USE - For control of **prosthetic** devices.

Dwg.3/5

Derwent Class: P32; S05; V06

International Patent Class (Main): A61F-000/00; A61F-002/54

International Patent Class (Additional): A61F-002/70

File 348:EUROPEAN PATENTS 1978-2004/Nov W04

File 349:PCT FULLTEXT 1979-2002/UB=20041202,UT=20041125

Set	Items	Description
S1	1835	ELECTROMYOGRA? OR MYOELECTRIC? OR EMG
S2	134064	ELECTRODES OR TRANSMITTERS
S3	148239	IMPLANT? OR SUBCUTANEOUS? OR SUBDERMAL? OR EPIM?SIUM OR EP- IM?SIA? OR INTRAMUSCULAR? OR INTRAFASCICUL? OR INTERFASCICUL?
S4	64481	ARTIFICIAL
S5	19917	PROSTHES?S OR PROSTHETIC?
S6	803664	ARM OR ARMS OR HAND OR HANDS OR LEG OR LEGS OR FOOT OR FEET OR LIMB OR LIMBS OR EXTREMITY OR EXTREMITIES
S7	69725	MUSCLE? OR MUSCULAR? OR FLEXOR OR EXTENSOR OR PRONATOR OR - SUPINATOR
S8	58827	TRANSDUCER? ?
S9	47959	S8 NOT S2
S10	28	S1(S)S9
S11	2	S3(S)S10 [not relevant]
S12	8	S6(S)S10
S13	5	S10(S)S4:S5
S14	2	S13 NOT S11:S12
S15	17	S10 NOT S11:S14
S16	513	S1(S)S2 NOT S10
S17	106	S16(S)S4:S6
S18	14	S3(S)S17

12/6/5 (Item 4 from file: 349)

00439679 \*\*Image available\*\*

DIGITAL MOTOR EVENT RECORDING SYSTEM

14/3,AB,K/2 (Item 1 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT

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00374506

METHOD FOR CONTROL OF PROSTHESES AND OTHER AID MEANS

PROCEDE PERMETTAN L'ACTIVATION D'UNE PROTHESE OU DE TOUT AUTRE APPAREIL  
D'ASSISTANCE

Patent Applicant/Assignee:

CYPROMED A S,  
STAVDAHL oyvind,  
GRONNINGSAETER Aage,

Inventor(s):

STAVDAHL oyvind,  
GRONNINGSAETER Aage,

Patent and Priority Information (Country, Number, Date):

Patent: WO 9715249 A1 19970501

Application: WO 96N0246 19961022 (PCT/WO NO9600246)

Priority Application: NO 954221 19951023

Designated States:

(Protection type is "patent" unless otherwise stated - for applications  
prior to 2004)

AL AM AT AU AZ BB BG BR BY CA CH CN CZ DE DK EE ES FI GB GE HU IL IS JP  
KE KG KP KR KZ LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD  
SE SG SI SK TJ TM TR TT UA UG US UZ VN KE LS MW SD SZ UG AM AZ BY KG KZ  
MD RU TJ TM AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE BF BJ CF  
CG CI CM GA GN ML MR NE SN TD TG

Serial 10/069559

December 6, 2004

Publication Language: English

Fulltext Word Count: 3044

English Abstract

Described is a method for controlling **prostheses** and other assistive devices using tissue whose state is influenced by the central nervous system of a user. The state of the tissue is sensed, and information from this sensing is fed into a unit (9, 10) that estimates the motor intention of the user and controls the **prosthesis** according to this estimate. The method comprises transmission of ultrasound signals into the tissue by use of an ultrasound **transducer** (6) and then reception of the ultrasound signals modulated by the tissue by use of an ultrasound **transducer** (7). Based on these received ultrasound signals, the motor intention of the user is estimated, and based on this mentioned estimate a number of **prosthesis** states are controlled.

Fulltext Availability: Detailed Description

Detailed Description

... undesired variations in the signal amplitude, and thereby directly influence the 30 control of the **prosthesis**. Furthermore, **myoelectric** and myoacoustic signals measured on the skin surface express a weighted sum of the activities of all **muscles** in the area where the detecting **transducer** is placed, but it is difficult to discern between the contributions of the individual **muscles**...

15/6/12 (Item 7 from file: 349)

00326482

APPARATUS AND METHOD FOR TIME DEPENDENT POWER SPECTRUM ANALYSIS OF  
PHYSIOLOGICAL SIGNALS

18/6/10 (Item 8 from file: 349)

00763392 \*\*Image available\*\*

METHOD AND APPARATUS FOR MONITORING TENDON MOTION

18/3,AB,K/9 (Item 7 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT

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00780650

**EMG CONTROL OF PROSTHESIS**COMMANDE **EMG** DE PROTHESES

Patent Applicant/Inventor:

RISO Ronald R, Herluf Trolles Gade 28, 2.th., DK-9000 Aalborg, DK, DK  
(Residence), US (Nationality)

Legal Representative:

PATENTGRUPPEN APS (agent), Arosgarden, Aaboulevarden 23, DK-8000 Aarhus C  
, DK,

Patent and Priority Information (Country, Number, Date):

Patent: WO 200113778 A2-A3 20010301 (WO 0113778)

Application: WO 2000DK464 20000821 (PCT/WO DK0000464)

Priority Application: DK 991149 19990820

Designated States:

(Protection type is "patent" unless otherwise stated - for applications  
prior to 2004)

AE AG AL AM AT AT (utility model) AU AZ BA BB BG BR BY BZ CA CH CN CR CU  
CZ CZ (utility model) DE DE (utility model) DK DK (utility model) DM DZ  
EE EE (utility model) ES FI FI (utility model) GB GD GE GH GM HR HU ID IL  
IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO

NZ PL PT RO RU SD SE SG SI SK SK (utility model) SL TJ TM TR TT TZ UA UG  
US UZ VN YU ZA ZW

(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE

(OA) BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG

(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZW

(EA) AM AZ BY KG KZ MD RU TJ TM

Publication Language: English

Filing Language: English

Fulltext Word Count: 6325

English Abstract

A method and a system for controlling a **prosthesis** such as an **artificial limb**. **Electromyographic (EMG)** signals are used to generate control signals for one or more **prostheses** such as **artificial limbs**. The **electromyographic (EMG)** signals are received by one or more sets of **electrodes** dedicated to a source of **electromyographic (EMG)** signals. By using dedicated **electrodes**, **electromyographic (EMG)** signals originating from well-defined sources may be picked up. Consequently, **EMG** signals stemming from a **muscle** which would be activated by a human being when this human being would move a part of his body, e.g. a **limb** or a part of a **limb** replaced by a **prosthesis**, may be detected, picked up and used to control the corresponding **prosthesis** or corresponding part of the **prosthesis**.

Fulltext Availability: Detailed Description

Detailed Description

... a missing part of the body replaced by a **prosthesis**, e.g.

**muscles** in an **arm** of a below elbow (BE) amputee. However, the sets of **electrodes** may be **implanted** in any residual **limb** or other **muscles** as desired in order to improve the **EMG** signal pattern discriminability. For example, a **muscle** in a shoulder part of an amputee may provide resourceful **EMG** signal information relating to the desired movements of for example a **hand** or an **arm**.

Preferably, as stated in claim 4, the **electromyographic (EMG)** signals from said...cross talk from other sources of **EMG** signals.

The **muscles** in which the sets of **electrodes** are **implanted** may for example be residual **muscles** related to a missing part of the body replaced by a **prosthesis**, e.g. **muscles** in an **arm** of a below elbow (BE) amputee. However, the sets of **electrodes** may be **implanted** in any residual **limb** or other **muscles** as desired in order to improve the **EMG** signal pattern discriminability. For example, a **muscle** in a shoulder part of an amputee may provide resourceful **EMG** signal information relating to the desired movements of for example a **hand** or an **arm**, whereby the functionality of the system may be enhanced.

As stated in claim 15, the...of a system according to the invention.

A human being 30 who has lost a **hand** has had a number of **EMG electrodes implanted** in the forearm 31. These are connected by means of wires 32 to a signal...

File 350:Derwent WPIX 1963-2004/UD,UM &UP=200478

Set	Items	Description
S1	728	ELECTROMYOGRA? OR MYOELECTRIC? OR EMG
S2	246639	ELECTRODES OR TRANSMITTERS
S3	102183	IMPLANT? OR SUBCUTANEOUS? OR SUBDERMAL? OR EPIM?SIUM OR EP- IM?SIA? OR INTRAMUSCULAR? OR INTRAFASCICUL? OR INTERFASCICUL?
S4	54839	ARTIFICIAL
S5	19176	PROSTHES?S OR PROSTHETIC?
S6	688552	ARM OR ARMS OR HAND OR HANDS OR LEG OR LEGS OR FOOT OR FEET OR LIMB OR LIMBS OR EXTREMITY OR EXTREMITIES
S7	38196	MUSCLE? OR MUSCULAR? OR FLEXOR OR EXTENSOR OR PRONATOR OR - SUPINATOR
S8	96707	TRANSDUCER? ?
S9	44	S1 AND (S2 OR S9) AND S4:S6
S10	46	S1 AND (S2 OR S8) AND S4:S6
S11	2	S3 AND S10 [1 duplicate; 1 not relevant]
S12	31	S10 AND S7
S13	29	S12 NOT S11

13/26, TI/4

DIALOG(R)File 350:Derwent WPIX

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013156954

WPI Acc No: 2000-328827/200028

**Electromyographic** apparatus for use in the diagnosis of **muscle** activity in the lower lumbar regions of humans, has **electrodes** and support having apertures and front and rear faces

13/26, TI/10

DIALOG(R)File 350:Derwent WPIX

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010426080

WPI Acc No: 1995-327400/199542

**Prosthetics** electrode array diagnostic system - has array of **electrodes** for testing **muscle**, and converts amplified and filtered electric signals detected from contraction into digital signal for transmission to computer to display one or more signals

13/26, TI/13

DIALOG(R)File 350:Derwent WPIX

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010010731

WPI Acc No: 1994-278443/199434

**Prosthetics** electrode array diagnostic system - using array of **electrodes** for testing **muscle** to produce electric signals from contraction which are amplified, filtered, and converted to digital signal for transmission to computer for display

13/26, TI/18

DIALOG(R)File 350:Derwent WPIX

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008504757

WPI Acc No: 1991-008841/199102

Processing **electromyographic** signals obtained from body **muscles** - using microcomputer to acquire data on actual wrist position from

precision potentiometer for display

13/7,K/1

DIALOG(R)File 350:Derwent WPIX

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015231150 \*\*Image available\*\*

WPI Acc No: 2003-292074/200329

Supple socket for upper **limb prosthesis** has rigid reinforcing member between silicone-coated supporting layers

Patent Assignee: LA RENAISSANCE SANITAIRE FOND PRIVEE REC (RENA-N)

Inventor: DECHAMPS E

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
FR 2828093	A1	20030207	FR 200110522	A	20010806	200329 B

Priority Applications (No Type Date): FR 200110522 A 20010806

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
FR 2828093	A1	42	A61F-002/80		

FR 2828093 A1 42 A61F-002/80

Abstract (Basic): FR 2828093 A1

NOVELTY - A socket (110) for upper **limb prosthesis** comprises a rigid reinforcing member (210) between two silicone-coated supporting layers, and a thin layer of foam padding. The reinforcing member, made from resin reinforced with glass or carbon fibres and molded on a 'positive' corresponding to the shape of the amputee's stump, is connected by an intermediate component to an **artificial** elbow or **hand**.

DETAILED DESCRIPTION - A socket (110) for upper **limb prosthesis** consists of a rigid reinforcing member (210) between two silicone-coated supporting layers and includes a thin layer of foam padding. The reinforcing member, made from resin reinforced with glass or carbon fibres and molded on a 'positive' corresponding to the shape of the amputee's stump, is connected by an intermediate component to an **artificial** elbow or **hand**, while the supporting layers are of a silicone coated woven fabric. Where the **prosthesis** uses **myoelectric** control, the reinforcing member has at least one generally rectangular or circular cut out for the connection of **electrodes** opposite the appropriate **muscles**.

An INDEPENDENT CLAIM is also included for a method of producing the socket.

USE - Socket for upper **limb prosthesis** for uses such as to replace an amputated **hand**, forearm or upper **arm**.

ADVANTAGE - The socket is designed for comfort, with a suppleness allowing it to adapt to variations in the shape of the stump.

DESCRIPTION OF DRAWING(S) - The drawing shows a perspective view of the socket.

Socket (110)

Reinforcing member (210)

pp; 42 DwgNo 1/48

Derwent Class: A32; A96; D22; P32

International Patent Class (Main): A61F-002/80

13/7,K/12

DIALOG(R)File 350:Derwent WPIX

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010283709     \*\*Image available\*\*

WPI Acc No: 1995-184968/199524

Computerised electronic **hand prosthesis** - transmits feedback signals representing gripping force to wearer to allow positioning and gripping force control corresp to capabilities and requirements of individual wearer

Patent Assignee: MCP SERVICES INC (MCPS-N)

Inventor: HASLAM T P; TOMPKINS M E

Number of Countries: 001    Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 5413611	A	19950509	US 92915618	A	19920721	199524    B

Priority Applications (No Type Date): US 92915618 A 19920721

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
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US 5413611	A		17	A61F-002/72	
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Abstract (Basic): US 5413611 A

The computerized electronic **hand prosthesis** uses input, feedback, control, and operating systems configurable to provide precise control and gripping forces corresponding to the particular capabilities and requirements of an individual wearer. An articulated **prosthesis** is capable of exerting a mechanical gripping force and contains a programmable microcomputer. **Electrodes** on the **prosthesis** contact **muscles** of the remnant portion of a **limb** and produce an electric command signal responsive to the **myoelectric** signal created by the wearer contracting and relaxing the **muscles** in the remnant portion.

A drive motor in the **prosthesis** causes the **prosthesis** to exert a mechanical gripping force responsive and proportional to the electric command signal. Force sensors in the digits of the **prosthesis** detect the force exerted and produce an electric sensor signal responsive and proportional thereto. A motor driven vibratory device on the **prosthesis** engages the remnant portion of the **limb** adjacent sensory nerves and produces a feedback signal perceptible to the wearer which changes in vibratory pattern and amplitude at various selective grip forces.

USE/ADVANTAGE - Computerized electronic **prosthesis** with selectively configurable operating parameters corresp to particular capabilities and requirements of individual wearer.

Dwg.3/9

Derwent Class: P32; S05; T01; T06; V06

International Patent Class (Main): A61F-002/72

International Patent Class (Additional): A61F-002/54

13/7,K/29

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WPI Acc No: 1975-F8057W/197522

Bioelectrically controlled **prosthetic member** - has reversible D.C. motor responsive to **muscular electromyographic** signals

Patent Assignee: LIBERTY MUTUAL INSU (LIBE-N)

Number of Countries: 001    Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 3883900	A	19750520				197522    B



Priority Applications (No Type Date): US 73395236 A 19730907

Abstract (Basic): US 3883900 A

The **prosthetic arm** has a drive, housed within the elbow unit, includes a reversible direct current permanent magnet torque motor and a transmission including a planetary gear reduction unit, a reverse locking clutch, and a planocentric unit and the transmission is connected to the forearm member with its output shaft part of the pivotal connection therewith. The forearm member houses a battery pack and the circuitry by which the motor is operated in either direction in response to **electromyographic** signals that may be picked up from the biceps and triceps by **electrodes** when attached to the stump and processed to drive the motor in a direction and at a rate dependent on the dominant **EMG** signals.

Derwent Class: P32

International Patent Class (Additional): A61F-001/06